The Builder.

VOL. XXXV. No. 1817. SATURDAY, DECEMBER 1, 1877.

ILLUSTRATIONS.

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On the Safety of Foundations.

SAFE foundation is the first object of the care of the experienced architect. So universally is this felt to be the case that the statement of the fact may be called a truism. It is, perhaps, open to that objection. But it is at the same time something more. It is, at all events, a very suggestive truism. The terms of the architect, as to this elementary necessity, have passed into the language of art, of science, of politics, of religion, and of philosophy. We constantly meet with reference to the fundamental principles of art and of science, to the bases of political or religious opinion, to the firm ground on which the edifice of philosophy is erected. When we seek to express something certain, fixed, indubitable, we speak of its sure foundation. It may not be amiss to look a little at the practical import of a word that plays so great a part in our ordinary language.

The importance to the architect of a thorough scientific acquaintance with the principles which should regulate the foundations of his buildings, and with the practical details which affect the application of his materials, becomes more apparent the more we advance in civilisation; that is to say, the more rapid is the increase of population, and the more densely is it agglomerated round its chief centres. The Arab drives his tent-pegs into the sand of the desert or into the sward on which he pastures his half-wild flocks or herds. The hunter, the fisher, the agriculturist, finds a dry and sheltered spot, on which to erect his hut, shanty, or shed, with little or no disturbance of the soil. But as huts collect into hamlets, as tracks become beaten into roads, as men collect into communities, more care and forethought become necessary in the foundation of their abodes. Drainage becomes needful. Year by year the provision for this element of health and comfort demands more care and art. An open ditch is found to be a nuisance. Culverts or covered drains are introduced. With this change from the original automatic action of rainfall and evaporation, a more elaborate foundation is required for the house. Security has to be looked into, so has health. Cellars are placed below the dwelling-rooms, both for economy of space, and for the sake of dry floors. Beneath these cellars the footings of the walls have to be carried, and the character of the soil on which they are laid demands careful investigation.

Again, as buildings increase in size, in weight, and in importance, the security of their foundations demands increasing care. Space fails; land becomes of more value. The side of a navigable river gradually assumes a commercial importance. Where a boat might formerly lie in the mud, a quay wall is now required. As commerce throngs the quay, the requirements of the shipper demand the aid of a crane. From a small jib worked by hand, or by a simple crab, the crane grows into a steam-driven, or an hydraulic, machine, capable of raising many tons at a time. Here, again, absolute security of foundation is required, and required often where the natural level of the spot is formed of ooze, wet sand, or half-dried mud. Nor is the growth of marine and riverside architecture confined to the shore. Piers jut out into the sea or river. Great bridges are required to maintain an unbroken communication over a stream or tide-way. Lighthouses, pier-heads, or forts are demanded for the protection of the growing harbour, and the architect may be called on to base structures of the highest importance on sites where a foundation can only be obtained by extraordinary labour, directed by practised skill.

M. Gaudard, a professor at the Academy of Lausanne, has given a series of lectures or papers on Foundations, a translation of which, by Mr. L. F. Vernon Harcourt, has lately been printed among the selected papers of the Institution of Civil Engineers. It will be of interest to look at some of the facts brought together by the Lausanne professor.

M. Gaudard classes foundations under two heads:—(1.) Ordinary foundations, on land, or protected from any considerable rush of water; (2.) Hydraulic foundations, in rivers, or the sea. Simple as this division may seem, it cannot be taken as exhaustive. Our own experience has furnished cases of difficulty and importance that will come under neither head. What would M. Gaudard say, for example, to a peat bog? What to a broad valley, covered with good turf, and offering firm support for any moderate weight, but covering a treacherous gulf of semi-fluid mud, which will rise in waves at the side, and allow of profound subsidence, if any heavy structure be raised on the deceptive soil? What would he say to sinking 4 ft. or 5 ft. below a dry marly soil, and finding a running sand, full of water, below? These are instances that occur in the practice of the English architect or engineer. They form a very difficult study. In fact, so far from a simple division of foundations into ordinary and hydraulic being adequate, a long series of cases may be suggested, each of which demands special treatment, and offers special difficulties. The presence of water is the chief, but by no means the only, cause of difficulty.

The limiting expression for the resistance of a foundation must be within the crushing strength of the material of which it is composed. As to this we have much experimental information, although not so much as might be desirable to attain. It would be of great service to the architect to have an exhaustive monograph written on the subject. The elastic strength of materials (cast iron excepted) is, in general terms, half of its ultimate or breaking strength. The elastic limit of cast iron is not yet clearly determined but the same proportion is usually allowed. The mean comparative strength of cast iron, obtained from a number of experiments by Mr. Hodgkinson, was 38·525 tons per square inch. This, of course, is something immensely beyond the demand that the architect can in any case have to make on the resistance of any material. We mention it only as an outside figure. Coming to the materials ordinarily to be met with in a natural condition, the highest resistance yet tabulated is that of the quartz rock of Holyhead, across its plane of lamination, which is given by Mr. Mallet at 11·4 tons per square inch. If the weight be applied parallel to the lamination, this stone will crush with 6·25 tons per square inch. This is a very great strength. Irish greenstone has a resistance to crushing weight of 9·30 tons per square inch, according to Wilkinson; Irish slates, resistances of 10·60 tons on beds, and 6·23 tons on edge, according to the same experiments; Irish marble, of 9·0 and 6·75 tons per square inch. Aberdeen granite has a resistance of 4·87 tons, according to Rennie; Peterhead, of 3·70 tons; Cornish, of 2·83 tons. Sandstones range from 3·52 tons per square inch for Arbroath pavement, to ·97 for Runcorn red sandstone. Marble is quoted as 4·32 tons for the ordinary white-veined, and 1·44 for statuary marble. Irish limestones, which are akin to marbles, rise to a strength of from 7·56 to 5·06. Purbeck stone has a crushing weight of 4·09. That of chalk is as low as ·224. This is inferior to the strength of bricks, which vary from ·358 for red bricks to 3·275 for rough Staffordshire blue. Stourbridge fire-clay has a resistance of ·766. We caution the reader, however, that the resistance of ·358 for ordinary red brick, which was obtained by Rennie, is not now to be taken for granted. As bricks are at present made, they require experiment. Mr. E. Clark gives a resisting power for brickwork in cement of only ·232 tons per square inch,—hardly more than that of chalk. The strength of Portland cement depends on its age, and on the quantity of sand mixed with it; varying from 2·67 tons when neat, and 2·04 tons when mixed in the proportion of one to one sand, when nine months old, to 0·43 when in the proportion of five sand to one cement, and only three months old. Blocks of concrete made with Portland cement, being 12 in. cubes compressed, twelve months old, have given a resistance of 170·5 tons per block, or 1·18 per square inch, if one to one; and 91·0 tons per block, or ·62 tons per square inch, of six sand to one cement, when six months old. Mortar varies from ·194 to ·357 tons per inch, according to qualities of lime and sand. It will result from the above that half the lowest resistance shown, or, say, 1 cwt. per square inch, being about eight times the atmospheric pressure, is the utmost weight to which a careful architect will subject the area of ordinary foundations. And in allowing a weight of this magnitude to come on the ground, care has to be taken to ascertain the geological nature, and actual condition, of the site.

M. Gaudard gives from 55 to 110 cwt. per square foot as a safe load on stiff clay, marl,

sand, or gravel. From 165 to 183 cwt., or about 25 per cent. more than we have ourselves above indicated, have been put on close sand in the foundations of the Gorai Bridge, and on gravel at the Loch Ken Viaduct at Bordeaux. Some settlement has taken place with a load of 152 cwt. per square foot on a bridge at Nantes. Under the cylindrical piers of the Szegedin Bridge in Hungary, the soil, consisting of clay intermixed with fine sand, bears a load of 133 cwt. per square foot; but it was deemed expedient to increase its supporting power by driving piles in the interior of the cylinders, and also to protect the latter by meeting outside. The pressure on the bottom of the cylinders for the Cannon-street Bridge is stated at 117 cwt. per foot super., and for the Charing-cross Bridge at 159 cwt. The pressure on the rocky foundation of the Roque-Favour aqueduct is 267 cwt. per square foot. The ordinary pressure of the atmosphere, which may be taken to denote the minimum resisting power of the most unstable foundation, is about 19 cwt. per square foot. The weight which the human body brings to bear on the small area on which the pressure of a well-formed foot (without a shoe) normally comes, is about two-thirds of the pressure of the atmosphere, for a man 5 ft. 6½ in. high. Thus the surface of an Irish bog, of a Scotch moss, of a Welsh marsh, or of a Lincolnshire fen, over which a man can just step without displacing the tufts of reedy grass on which he puts his foot, has a resisting tenacity of about 12 cwt. per square foot. The weight of a house 30 ft. by 15 ft., and 25 ft. high, with walls 18 in. thick (taking roof and floors to weigh as much per square as a single wall), only comes to about 8·5 cwt. per foot of area; so that if the weight of the walls were thrown on a platform and distributed over all the area covered, the house would be quite stable on the bog. But as the weight actually is distributed by means of footings, the usual pressure on the base of the walls will be about double that which would result from the distribution of the pressure over the whole area covered by the roof. The weight of a granite obelisk 72 ft. high on its own base, is about 6 tons per square foot. We have seen that the lowest resisting power attributed to granite is 2 83 tons per square inch. Assuming, therefore, half the crushing resistance as the limit of safety, a granite column might be raised to the height of more than 2,000 ft. before the lower stones were in any danger of crushing.

These data lead to the remark, which may not be in the first instance obvious, that the Pyramid is anything but a truly architectural form of structure. The admirable materials at the command of the ancient Egyptians allowed them to adopt any form of edifice which the fancy of the architect might suggest. They were not bound and tied to that grace which springs from a scientific use of but slightly resisting material. In fact, no simple form of structure can be worse adapted for stability, as far as the question of foundations is concerned, than the Pyramid. The great Pyramid had a height of 485 ft., with a base 764 ft. square. But the weight of this prodigious mass of 3,500,000 cubic yards of masonry is about as ill distributed over the area of the base as it is possible to contrive. At the outer edges the pressure commences at nothing; while in the centre, if the mass were solid, it would be as much as 40 tons per square foot. This does not, as we have seen, indeed, approach the crushing strength of granite, or of the harder stones. But if we make the proper correction for the weights and resistances, we see that a brick pyramid of such dimensions would far too narrowly approach the limits of resistance for the lower courses in the middle of the structure, even for burnt bricks. And with regard to almost any foundation except the live rock, the imposition of so ill-distributed a weight would be extremely likely to cause displacement. Thus viewed as a matter of foundation, a pyramid is anything but a symbol of architectural permanence and stability; although, as a mere form of resistance to atmospheric and meteoric action, it may to some extent be regarded in that light.

Returning to the recommendations of the Lausanne professor, we find the statement that "when the ground consists of rock, hard marl, stiff clay, or fine sand, the foundations can be laid at once on the natural surface, or with slight excavation, and with horizontal steps where the ground slopes." We should be extremely sorry to follow this advice for the erection of any building of great magnitude. Under no circumstances should the foundations of a tower, fort, palace, cathedral, or large bridge be laid on the natural surface. Even in the case of solid rock a certain portion should be removed, in order to give a proper bed for the lower courses of the building. The plan of stepping up the foundations is one that should be regarded with considerable jealousy. Independently of any questions that may arise as to displacement of the ground under the steps, the mere fact of basing a heavy wall on portions of masonry or concrete of different thicknesses is objectionable. The subsidence in the case of brickwork, or the swelling which sometimes takes place in the solidification of concrete, gives a total movement of the plane at the upper surface of the work proportionate to the thickness of the work itself below. This will be quite enough, in case where the slope is abrupt, to interfere with the regularity of the courses of the work above. Our recommendation would be to the very contrary of M. Gaudard's suggestion, that in any cases where, for the sake of economy, the foundations of a great building are stepped, sufficient time must be allowed for the subsidence, consolidation, and drying of the foundation work before any attempt should be made to carry on the superstructure. We have recently seen how careful Smeaton was not to raise his famous tower with too much haste. The same criticism applies to the recommendation to spread a layer of concrete over an uneven surface of rock, in order to afford a level foundation. If there be one foundation more inappropriate than another to be overspread with concrete we should say it was live rock. "Sometimes," M. Gaudard says, "large buildings have been securely built on quicksands, of too great thickness to be excavated, by the aid of excellent hydraulic mortar, and by excavating separately the bed of each bottom stone." It is difficult to understand the meaning of this sentence, which continues,—"Such a building will be stable if its pressure on the foundations is uniform throughout, and if it is placed sufficiently deep to counterbalance the tendency of the sand to flow back into the foundations." It is hardly possible that the translator can here have done justice to the professor. The sentence, as it stands, absolutely fails to convey any meaning to the mind. This is the more to be regretted, because the case referred to is one of the most difficult that is met with in the practice of the architect or of the engineer. We can recall two instances that came under the personal knowledge of the writer, of building on running sand. One was in the case of the foundations of a bridge in wet sand, which ran, when excavated, together with the water. But the sand itself was sharp. It was not a mere silt or mud. As the water was drained from it, it solidified; or rather remained perfectly solid. In that case the plan adopted was to lower the whole surface of the water in the hill containing the stratum by several feet, an operation which was effected by tapping it by lateral drains. This took some months to carry out, and was attended by an unlooked-for expense. All the inhabitants of the adjoining hamlet made complaints as to the drying up of their wells; and it became necessary to lower every well in the place, or otherwise to compensate the owners or occupiers. When the water was thus lowered as far as practicable, large rough stones were made to find their own bed on the wet sand below them, and the masonry was carried upon these stones in the usual way. Of course the use of good hydraulic mortar in such a case is indispensable. The work stood perfectly.

The only case which we can cite as in any way explanatory of the experience above quoted, as to excavating separately the bed of every bottom stone, is that of the Thames Tunnel. During a portion of this work headway had to be made through a muddy silt, which offered no support for the brickwork. The plan there adopted was to use an iron frame or shield, made in compartments, so that a small portion could be pushed forward at a time. Bricks were thrust in by the workmen on the removal of each shovelful of silt; and immediately set in cement. Thus a solid wall was gradually protruded, as if it grew, through the water; and the cross arches were subsequently cut by hammer and cold chisel out of this solid mass. This was a work of peculiar delicacy, difficulty, and danger. It was not the foundation alone that required this unusual care. The whole work was, so to speak, foundation. It was the protrusion of a pair of brickwork pipes through strata of treacherous character, under the bed of a navigable river,—in fact, through the mud-ground formed in the course of ages, by the deposits of that river, and the silting up of its bed. As a case of dealing with running wet material it is without any good parallel in our public works, unless the Kilsby Tunnel, which very nearly arrested the progress of the London and Birmingham Railway, be taken as a companion triumph.

M. Gaudard cites, as instances of this kind of difficulty in the laying of foundations, the works of the Metropolitan Railway and Metropolitan Board of Works; those of the Paris sewers, and the excavation for a sewer at Grenoble. In the former case the danger to which the noble façade of Somerset House was exposed was pointed out in the columns of the *Builder*, as well as the various expedients proposed or adopted in order to prevent the abstraction of the layer of sand on which a portion of the metropolis stands, by tapping the water of which it was then full. In the Paris sewers, the upper part of the culvert was built first. "A little trench was then dug out at the bottom, each side being supported by interlined boards, and this trench was then pumped dry in lengths of about 110 yards at a time. When one length was dry, a second row of boards was beaten down on the top of the first row, and at last it was possible to excavate the soil in lengths of 13 ft., carefully shored up, in which the lower portion and the invert could be constructed, completing the section of the culvert." The description is not a model of clearness, but it is, perhaps, possible to pick out what it means. The culvert in question was 9 ft. 10 in. wide and 12 ft. 6 in. high. The underworking of this arch strikes us as an extremely dangerous and difficult mode of accomplishing the task. 2,950 feet in length are said to have been thus constructed in eighty-five days. The work at Grenoble was carried on in a more normal manner, the sides being built as the excavation proceeded, and the floor of the culvert being laid in quick-setting concrete. The above instances have been taken from that portion of the paper which speaks of ordinary foundations, and fully justify our remarks as to the arbitrary and unsatisfactory nature of the division adopted. The subject is one of great professional interest, and it will be proper to return to it. We have made use of the selected paper, rather as a text than as affording a true basis for the instruction of the student. It is not our wish to go out of our way in order to attack a foreign lecturer, especially when his work comes before us in the unsatisfactory shape of a translation. But the attention of many students must have been recently directed to this A B C of the work of the architect. The wide field over which the examples taken by M. Gaudard extend is such as to give some assurance of a practical illustration of the subject. It is, therefore, the more necessary to allow no case of haste, of misstatement, or of misapprehension, to remain without challenge. It is as essential to have a clear scientific knowledge of the requisites of a safe foundation, as it is to have a practical experience of the difficulties met, and of the expedients successfully adopted to obviate them. The student should never forget the difficulties which Sir Christopher Wren encountered in laying the foundations of St. Paul's, nor the patient and unflinching manner in which that great architect laid, on that awkward basis, the solid structure of his most famous monument.

A WORD ON THE THIRLMERE SCHEME.

WATER FOR MANCHESTER.

We have refrained from taking any part or pronouncing any decided opinion in regard to the proposed acquisition of Thirlmere by the Manchester Corporation, as the question of the moral and scientific righteousness of the proceeding must be eventually determined by considerations based upon detailed information as to the real wants of Manchester and the real intentions of the Corporation, which is not publicly accessible at present, but which will doubtless be elicited when the scheme comes before Parliament. The publication of a second pamphlet of protest by the "Thirlmere Defence Association" suggests, however, a remark or two which may contribute to narrow the grounds of the contest.

The Association, which includes some very good names, desires to arouse public feeling on the subject, regarding the beauty of the Lake district as a national possession, not to be lightly trifled with; a principle in which, on general grounds, we of course entirely concur, as well as

many others who are not taking part in the agitation. The protesting party wish to get up a petition with numerous signatures, as a first step towards an organised opposition to the scheme, should it really come before Parliament. A good many of our readers, no doubt, have been or will be asked to join in the opposition, and while thinking it premature to express a decisive opinion on this particular scheme, we may call their attention to the real point at issue, which is, unintentionally perhaps, evaded in the exhortations of the Defence Association. We spoke just now of the scientific and the moral rectitude of the scheme, but these two elements in the question cannot really be separated. Pure water in large quantities is a necessary of healthy life in large towns, and it is also necessary that it should be got in the best and most economical manner, and from the source which is least likely to fail or be exhausted. If this cannot be efficiently obtained without spoiling a landscape, it is a great pity, but we should opine that no sane person can be in doubt that in such a case the landscape must give way. Health is the first consideration. We may enjoy health without scenery; it is notorious that many thousands of people do: we cannot enjoy scenery without health. And when it comes to the question of a very large town demanding fresh water,—a necessary of life, as against the regrets, natural and reasonable in themselves, of a comparatively small number of persons who cannot bear to see their neighbourhood or their holiday-ground, and its associations, interfered with, the "greatest happiness of the greatest number" forms an obvious factor in the problem. Assuming for the moment that the wants of Manchester and its immediate neighbourhood cannot be adequately supplied in any other manner, without extravagant expense, their demand for water would amount almost to a moral right, on behalf of the poorer classes especially, whose life in large towns it is so difficult to make healthful with all the aids we can give. They might say, in effect, to the dwellers in the Lake district,—"The circumstances of our life compel us to crowd together in a town; we have not the good fortune to live, as you do, in beautiful scenery, and by lakes of pure water; very few of us can even go to look at your beautiful neighbourhood; give us, at least, a little of the pure water you have stored up there; it may spoil your prospect, but it will be a matter of health and refreshment to us." Is such a demand so unreasonable? And if it be said that the Lake district is a national possession, a place of refreshment to the eye and mind of those who are wearied with business, we repeat that it is the minority only who can avail themselves of it in this way; while, on the other hand, the health of a great town is a matter which affects more than its own inhabitants,—which affects, as every physician knows, the spread of disease generally, and also in other ways is bound up with the general welfare of the community, whose interest is that of all its working members.

Still assuming (only for the sake of argument) that adequate water supply for Manchester cannot be found nearer its own neighbourhood, we may notice one special grievance which the opposers of the scheme emphasise particularly; namely, that Manchester wants to get more water than is really necessary for its own purposes, and to become purveyor of fresh water for that district of England: with the additional grievance that Manchester in that case will make money out of it. This is very bad, truly; but we fear it is what is generally done in this degenerate stage of existence. If water is wanted for that part of England adjacent to Manchester (and we must assume that those who wish to become suppliers of it see reason to expect a demand), it will be an act of usefulness to procure it; and we presume it is not to be seriously contended that there is anything wrong in getting back part of their expenditure by the supply of an article because it is a necessary of life. At that rate, we might blame the bakers for expecting a profit on their bread.

So far we have been simply putting the case on the supposition that an adequate supply of water cannot be found nearer to Manchester, and in a manner less objectionable on the score of disfigurement of a landscape and annoyance to sentiment and association; drawbacks which we believe we should be naturally disposed to overrate rather than underrate. We merely point out to what ground it is that the question must ultimately be narrowed. The problem of providing pure water for large towns is becoming of increasing difficulty as these towns, under the centralising motives of modern life, become continually larger, and, therefore, more complicated in their arrangements and requirements; and if we cannot get it without drinking up some of our lakes, we must drink them up, and there is an end. On the other hand, let it be understood that we are by no means suggesting for a moment that the Manchester Corporation should be allowed to take Thirlmere merely because that scheme pleases them best, or suits their pocket best. On the contrary, we hold that every practical step should be tried rather than spoil a beautiful spot; and that if the demand can be supplied adequately from any nearer source, adequately for the future as well as the present, the Thirlmere scheme ought to be quashed: and it is well that there should be a strong opposition, in order that the truth of the case should be thoroughly elicited. But the question must be put on its proper footing. It is of no use for the Thirlmere Defence Association to oppose the matter from the point of view of sentiment merely, which is what their pamphlet in reality amounts to: because a question of health must carry the day against sentiment. They would have made their case, as here presented, a great deal stronger, and indeed have put it on quite a different footing, if, instead of saying in general terms that Manchester and the neighbourhood could get water in sufficient quantities from other sources nearer, they had stated what they considered those sources to be, and what is known of their supplying power. This they do not; and their case, in fact, really amounts to saying, "Get water where you can, but you shall not have it from us."

A word as to the real probabilities of the effect upon Thirlmere and the Lake district. It is to be regretted that the promoters of the scheme have volunteered to say that what they mean to do will not spoil the district or the appearance of the lake. That is rubbish. Of course, it will damage it; and for its promoters to say otherwise proves that they are either very deficient in perception of what makes the sentiment of landscape, or that they are somewhat disingenuous. The remarkable proposition, which we believe was seriously put forward, that the proposed embankment across the head of the lake should be artificially made to look natural and picturesque by the addition of "rocks," seems to argue the former deficiency rather than the latter. The Manchester engineers had better quit that ground; their scheme will not "hold water" in that way, at all events. They had better say, frankly, "We are sorry to spoil a pretty landscape, but we want a good supply of water." Then the question will be argued on its real merits. If it should be carried out, we hope that there will be no attempt at any landscape-gardening. That defeats its own end in such a case. Engineering works of this kind are for the most part least offensive to the eye (and in some cases have been quite the reverse) when done in the simplest and most unostentatious manner; the arrangement of materials, so as to combine economy with strength, often leads to a result more in harmony with nature (because designed in direct relation to natural forces) than any attempt at what may be called ornamental treatment, whether in the landscape-gardening or the architectural direction. We can hardly conceive that the mere embankment across the outlet of the lake would be so serious an eyesore in the landscape as some people seem to fear. The really serious point in regard to disfigurement seems to us to be that which the Defence Association have brought out rather pointedly in the map appended to their pamphlet; the laying bare of the area to a great extent when the water is drawn off in a dry season. They admit, however, that since their map was drawn the promoters of the scheme have partly met this objection by a proposal to raise the level of the water by 5 ft. more than was at first intended, it being supposed that with this additional large bulk of water any necessity for materially reducing its level would hardly be likely to arise, except under very exceptional circumstances. This may be so; but we quite feel that, in regard to this, the dwellers in the neighbourhood of the lake would have a real and tangible grievance; and their prediction that of course the owners of the water would make the utmost use they could of it, is one that cannot be passed over. This might be met to some extent by a provision that the water was not to be drawn off below a certain level. There are two other objections which have less weight. The opponents make a great outcry about the aqueduct, which will have to be built, and which, they say, will not only deform the landscape, but will suspend a great volume of water at a dangerous elevation. As to this, the stream requisite to keep up the daily supply talked of would hardly amount to what can be called "a great volume of water," regarded from an engineering point of view. The writers are probably hardly aware how small a pipe, comparatively speaking, will carry a very large supply of water, if the flow is continuous. And as to the appearance of the aqueduct, all building and engineering operations disfigure the site on which they are carried on, *while in progress*, no doubt; but when fairly completed, and the rawness of new work worn off, we are much mistaken if it might not prove rather an addition to the picturesque elements of the scene than otherwise. Many large existing aqueducts admittedly are so; the great works of this kind which have been carried out by the French Bureau des Travaux Publics are among the things that the nation may be proud of; and at the worst we may just call the attention of the objectors to the fact, that there is not a single line of railway going through any pretty district of England against which the same cry was not raised at the outset; yet we find hundreds of thousands of people annually finding holiday enjoyment in scenes which it was said were to be irretrievably ruined, and which most of them would never have been able to visit or to see at all but for the very railway which was supposed to work the ruin. The case we are speaking of is not in this sense quite parallel to that of a railway, certainly; but then an aqueduct is a much less objectionable thing than a railway embankment; it almost carries the necessity of a certain picturesqueness inseparable from its construction. The other fear expressed by the opponents, which we think fallacious, is that this will be the signal for every other municipality to want a lake drained for itself. That would be a rather serious demand; but we do not see where the towns are that are to make it. It is only very large, crowded, and wealthy manufacturing towns that can either want or pay for such accommodation on so large a scale; probably we may say that the only two provincial towns at all analogous to Manchester in this respect are Birmingham and Liverpool. The former is too far south to meddle with the Lake district; Liverpool, we believe, is rather short in its supplies, and has mooted a lake scheme more than once; but these are the only two that could want such a mode of supply, for a long time to come at least. Large towns do not at present tend to multiply: it is only that the existing chief centres tend to increase sometimes to very unwieldy proportions. What London may have to do we will not just now discuss.

For ourselves, we should view the proposed scheme as a necessity much to be regretted, and to be avoided if possible, and those who oppose it will do a good work if they will compel its promoters to take every step in the first instance to find a satisfactory source of water supply which will not involve the serious annoyance to many people which this unquestionably will cause. Only let them put their opposition on a consistent and logical footing; and if it appear that nowhere can the Manchester district be so well supplied with wholesome water as from Thirlmere, do not let them grudge to persons less fortunately situated than themselves the boon of "a cup of cold water."

Dilapidated Tenements in Bermondsey. At a meeting of the parochial body known as the "Bermondsey Governors and Directors," on the 15th ult., the report of Mr. George Elkington (surveyor), with respect to the repairs required at No. 127, Bermondsey-street (Kendall's gift), stated that that tenement was in so dilapidated a condition that it was totally unfit for human habitation, and recommended the Board to give the usual three months' notice for repairs; and that on the expiration of such notice, if the necessary repairs were not made, legal steps should be taken. Mr. Shepherd wished to know what was the usual practice with reference to the charity estates. Had there been no periodical visitation? The clerk said, not in his time. Mr. Shepherd said he thought it was a very great scandal that the Board, being trustees of property and money left by their predecessors, should take so little interest in their trust, and moved that the surveyor be deputed to report on the whole property under their trust. The resolution was agreed to.

MUST AN ARTIST BE ONLY AN ARTIST?

PROFESSIONALISM.

To what extent do the requirements of a liberal education in the fullest sense hamper and disable the demands of the most efficient professional education? On the other hand, is it possible for professional accomplishments to attain their highest perfection apart from participation in Liberal education, even to some very considerable extent?

How far is professional success, and how far professional efficiency, jeopardised by predilection for original inquiry,—by enthusiastic devotion to extending knowledge over undiscovered regions,—to finding out the yet unknown, instead of restricting one's self to simply making the best use of what has already been discovered?—by an ardour to originate new precedents, and not merely to gain a mastery over the old? Even in the case of allowed devotion to historical or theoretic investigation, how far is such pursuit promoted or impeded by including a very large and very varied field of nature, as well as art, within the scope of research?

These, and such as these, are questions which come up in the mind as we glance over the speeches of ministers and ex-ministers of education, in this extra-Parliamentary season,—over opening lectures of medical schools, and schemes of reformed academies and universities, and the leading articles and multifarious correspondence that they call forth in such earnestness and such abundance.

Two universities of North Britain have recently been in correspondence, not to say controversy, as to the terms on which the degree of Medical Doctorate shall be granted, and open up a subject that has bearings beyond the walls of the medical schools: shall the coveted "letters," M.D., be granted on proof alone of complete medical acquirements, or shall a condition be annexed of a certain, and perhaps a considerable, knowledge of Greek? The divergence between Edinburgh and Aberdeen, at this crisis of medical certification, is manifestly about a principle which may have its application at any time to any other profession,—to the official promotion of students in any art and at any stage of general education. It is conceded, of course, that not in medicine alone, but in any branch of study,—in architecture not the least,—the very nomenclature and technology can scarcely be understood satisfactorily without some knowledge of Greek, but what this amounts to is so simply rudimentary that a demand for it can scarcely be taken to affect the main question. This question is not so much or so seriously on what terms a degree shall be conceded, as under what circumstances, if conditions are unreasonable, it may be as unfairly as unhappily withheld. It is very desirable, no doubt, that all students who are admitted to the Life School of the Royal Academy,—to go here for an example,—should, in addition to a certain proficiency in draughtsmanship, have something more than an average of educational advantages; but it is more desirable that no rule must be established that would have involved the certain exclusion of a Turner, to name no others. Unless the French orthography of Napoleon only lost its accuracy in later years, some autograph documents which we have recently seen would assuredly have excluded him from Brienne by the application of rules which have sufficed to exclude heirs of very distinguished naval and military names from the chance of emulating ancestral careers. The scheme of granting to Owens College the right of conferring degrees is opposed with vehemence, on the ground of risk that a less stringent or less comprehensive test will be rewarded there by a title which elsewhere indicates superior general accomplishments, and that so the better merits will lose their due distinction. True it is, as we know, that such things have been,—that foreign universities have made merchandise of degrees; and titles are current, in consequence, that cast a suspicion on the origin and value of others won by more genuine process. The title of "Doctor" has been pirated thus unscrupulously, while "Professor" is apparently the common property of all who profess anything whatever, from science and literature to thaumaturgy and hygeism. Not that the dreaded equivoque is not initiated already, and likely to advance. So far as examination of one or two sets of papers indicate, it appears that matriculation at one university demands acquirements which should be sufficient for a final degree, and at another probably are so. A certain remedy would seem to be, to allow different establishments to give their own degrees, but with signs of origin; so that M.D. Cantab., and M.D. Londin., or M.D. Mancun., &c., and M.A. and LL.D., &c., similarly distinguished, might carry with them, by general notoriety, a declaration of special standard as to the kind and degree of accomplishments that have in each case been verified.

But be the art in question medicine or architecture, the official sanction for professional competence should be uniform, and by uniform test. These questions have a double aspect, from points of view of the public and of the professional man himself; but difference in point of view does not, as is too frequently assumed, alter the matter-of-fact that is under such double inspection. The public are naturally concerned only to secure the utmost professional efficiency; the individual practitioner is perhaps excusably regarded by them as a cog in a wheel of the great machinery of society, whether in driver-wheel or follower, and so long as the cog is good and sound for its limited and special function, that is all that the indifferent public cares for and requires. And deny we may not, that a high standard of good service and of professional success may constantly be secured by those who consent to accept the conditions of such limitation. Valuable servants of the world have been numbered among these, and well deserving their honours and rewards for services conscientiously rendered. They are not leaders, it may be, in the highest sense, and,—

> "Content as men at arms to cope
> Each with his fronting foe,"—

perhaps do not aspire or pretend to be.

They may possibly direct no more and indeed see little more of the causes that sway the alternations of the conflict of tastes and battle of styles, than the bombardier who, enveloped in smoke, sees only the successive flashes of his own gun as he stands to it,—No. 3, but stands to it without flinching however the contest goes, and at least serves his own battery throughout with vigour and alertness, come what may.

But the question for the individual is often only to be decided by reference to his individual tastes, opportunities, purposes; and so far involves a great deal that society without does not always concern itself about, and probably will only do mischief by attempting directly to meddle with.

There are some who can achieve great success, and of no moderate general value, by strict economy of powers which are not very extensive,—even of powers of application which could never stand the strain to which others can subject themselves,—body and mind,—with impunity and effect. In such a case energy is wisely, and may be instinctively husbanded, for a main and clearly seen purpose or branch of study with the most careful frugality. Examinations that must be passed, matriculations, moderations, finals, and the rest of it are passed, but so much in the supposed case the more profitably, because most cheaply, if only barely passed by "scraping through" and collateral studies are pursued no step further than will palpably pay by results in the special direction which is limited by specialised capacity. The result of such a life for the world is often one single great discovery or great achievement that will bear fruit and branch forth under the tending care of successors; and sometimes a series of valuable services that help the world along for the time, and that the world will miss until it lights again upon as devoted a specialist. It is vain and futile to criticise such a career as based upon a mistake,—to criticise it as narrow, restricted,—as going but little way towards vindicating the dignity of science or art in all their grander comprehensiveness. So far as it does go it is good,—and it could not have gone as far as it has, had time been spent on studies preparatory to an enterprise for which capacities, genius, opportunities were unsuited or incompetent. It will indeed be usually found, if we look closely into such a career, that the limitation, decided as it may be, was not quite so absolute as it seemed;—that collateral study and research were not utterly wanting;—great results could scarcely be achieved without them;—but that a certain instinct guided to the directions which led most happily to what illustration of the special purpose was required, and as infallibly marked the point beyond which for such purposes it was unnecessary to pursue them,—if only because beyond this point the capacity to pursue them must fail.

When we light upon an example of a truly narrow mind working within a strictly narrow range, it will naturally prove that the life-result is not of true importance or important in any sense. But otherwise limitation may in truth be the condition of concentration,—the corrective of a tendency to fritter away time, and to substitute dissipation of energy for well controlled exertion.

Dissipation of energy is subject to rebuke in two forms,—as even intra-professional as well as extra-professional. The genius who could run through "all chords of the lyre, and be master of all," is doubtless more rare than the "Jack of all trades, who is master of none." It may be reasonably doubted whether the artist who can with equal ease and readiness throw off a design in any style of architecture whatever, and in each with equal observance of character and accuracy of detail and ornament, will prove at last to have executed even one which in its proper style stands unrivalled or even very highly distinguished. Here, again, we deal with a matter of degree; the exclusive familiarity and idolatry of a single style will as certainly cramp invention and limit ideas; we know nothing thoroughly in its best state of which we are not aware of the flaws and liability to failing,—and can scarcely appreciate specific beauty unless we know somewhat of other forms that are its contrasts and indeed its foils. Everything depends upon due subordination. In the study of composition, as in composition itself, unity, force, effect, depend upon the predominance of a central interest. When this predominance can be secured, there is scarcely a limit that need be set or can justly be set to the excursiveness of study. Sooner or later, the most seemingly erratic course may prove to be only erratic in the sense of planetary, as ever controlled by a central attraction. The apparently wildest digressions are found to have been made to end at last under the strictest conditions of regulated curvature, and, moreover, have reward by a home-bringing of associations, suggestions, discoveries, which give a richness to the elaboration of the single interest; the interest which, however out of sight for the time in seeming remoteness, was governing the orbit of the student all the time.

The same remarks apply in a general way to extra-professional studies,—studies which are not absolutely required either for professional distinction or professional success, that do not affect or influence proficiency in the art, and are as little the indispensable conditions and adjuncts of those so-called arts of life which very importantly promote the chances and the opportunities of the best employment of the best endowments.

But simple professional success is not all that a professional man may justly or worthily make the object of his life. His duty to himself, to his family—if he is so fortunate as to have one,—to his country also, be it added, do not demand, and,—if he excludes exaggerated estimates and protects his mind from the extravagance of passion,—do not involve, the utter sacrifice of all that enhances the dignity and the happiness of the very highest professional success and so much that goes far to compensate,—that may even more than compensate,—for voluntarily foregoing more than a certain proportion of such success.

> "It was not meant
> By Him that on the back the burden bound,
> That cares—though public, critical, and grave—
> Should so encase us, and encrust, as shuts
> The gate on all most beautiful below;—
> This was not meant, and him will not not befall,"

who, straining his energies for the attainment of a high standard of professional accomplishment, finds those energies reinforced by liberal excursions even beyond the several arts which the lofty point of view provided by his own art brings within his ken, over literature covering the history of his own art, to the literature that collaterally illustrates that history in *belles lettres*, the history of manners, the expression of character in poetry.

We have not to lay down laws for supreme and exceptional genius,—who is entitled to do so? This will, as it must, take its own way, and be as universal in its devotion to the arts as Michelangelo,—to the arts, both fine and useful, and even simply curious, as Leonardo,—or be as limited as men at the opposite extreme, who still have executed works which give them places among the world's chief benefactors. But even as between these two classes there is no doubt towards which side our sympathies incline,—nay, as to which class even by the standard of the value

of their best works, we owe the largest debt of gratitude.

The dignity of an art is enhanced immeasurably by the elevation of the general standard of taste, and general acquirements and accomplishments of its professors; and the whole body of professionals is under obligations accordingly to those among them who are ambitious to superadd to professional distinctions,—it may be, though not of necessity, at some professional sacrifice,—distinctions which would be honourable if standing alone, to all who advance without definite effort as naturally as unaffectedly into the front rank of refined and intellectual society. Assuredly those who become distinguished in virtue of such collateral development, and confer honour on their colleagues by reflected distinction, are not without their own reward. This is a reward which ever accompanies the highest culture of our natural endowments, especially when under the impulse and the government of a noble ambition at once, and a manly self-control, the reward which is even most valuable of all for the days when the immediate excitement of professional successes and disappointments is matter of the past.

So it is, then, that we might fairly demur to the degree which entitles to practise one art being denied to special aptitude and knowledge, on the score of inaptitude and ignorance in respect of literature and arts that are essentially connected with it; we may justly think it hard and wrong to be debarred or deterred from the services of the best skill, whether we have a limb to be removed, a disorder to be identified, or a house or a public building to be planned or reformed, because the best skill in these respects has failed upon a time in Greek construing or composition, misdated Edwards and Henrys, or was vague on the nomenclature of orchids or the differential calculus; but taking the position of the artist himself, assuredly he is to be congratulated, and the profession is to be congratulated on his account, who successfully asserts the compatibility of professional studies, professional practice, with sympathy for other arts besides his own, and the same interest in literature of whatever era, that is the proper heritage of cultured society at its best.

THE BOARD OF WORKS IN RETREAT.

THE scheme of the double water-supply for London, on the unsatisfactory nature of which we commented on the first promulgation of the scheme,* and again last week, received on the very day of the publication of our observations its first check, for such the result of the division on the subject at the Board of Works meeting unquestionably was. The resolution to bring in a Bill for carrying out the scheme was only passed before by a majority of seventeen against thirteen; and when Mr. Fowler, at the meeting on the 23rd, proposed a resolution that the former proceedings in regard to this point should be rescinded, the result was that in spite of the obvious and natural feeling on the part of a good many members against taking a step in retrogression, or, as it was said, stultifying the Board, the new motion was thrown aside by a majority of only three in a much fuller house, the numbers being in this case twenty-three to twenty. This may be called a victory by the supporters of the measure, but it is a victory very like a defeat. With such strong evidence of doubt and uncertainty in the opinion of the Board of Works themselves in regard to the project, it is not likely that those outside its circle who already strongly object to the scheme will be at all reassured by such a result; and we may say that in the face of this expression of vacillation the chance of such a Bill being carried is almost *nil*. The member who observed that the Board had gone to Parliament with many Bills before, and had failed, and that they would fail in that, is likely to prove a true prophet.

The resolution moved by Mr. Fowler, though formally stated in general terms, referred, as he himself observed, to the scheme of a double supply in particular; and there is no doubt that "there's the rub." London is becoming so vast and complicated an institution that, after efficiency, we must in all things aim at simplicity in the mechanism of its working. The proposed scheme does half the work only of providing pure water for Londoners, and does so by doubling the mechanism of supply. And when the public begin to realise what such a plan actually means, they will be opposed to the scheme by a much more decisive majority; and the Board, in their own interests, would have done wisely to listen to the member (Mr. Cuffiin) who counselled them not to go to Parliament with the Bill when they were so equally divided on the subject. The probability is, that in that case "the House" will be very unequally divided, with a large majority on the side of "the Noes." The scheme is one so peculiar and so partial in its character that no government would be very likely to assent to it unless it were demanded, as the best thing that could be got, by unmistakeable public opinion: and this is most unlikely to be the case. The expense of the scheme is great, and not as yet sufficiently estimated; the unsatisfactory nature of the result is patent to every one. It will not be nearly so much a question of cost and of increased rating as of what we shall get for this. It would be worth while to pay a great deal more, even, to get a complete and copious supply of good water; it is not worth while to pay a lesser but still enormous sum for a scheme which will only half meet that want, and will inflict a most costly and cumbersome system of supply upon us.

* See p. 847, *ante*.

THE DUDLEY GALLERY.

IT would be difficult to point out any remarkable work, or, in fact, any one that could be called the leading work, in the eleventh Winter Exhibition of Cabinet Pictures in Oil, which has opened this week at the Dudley Gallery. This absence of a central point of interest generally tells against an exhibition, giving an impression of mediocrity; but there is a good deal to interest in the collection. It appears to us that, in comparison with some years, there is less in this exhibition of the distinctly "cabinet-picture" element which it professes to represent, and by which we understand pictures on a small scale, but highly finished. On some former occasions there were some remarkably typical pictures of this class; in the present exhibition there are a good many which may rather be termed sketches and studies than cabinet pictures. So long as they are good of their kind, there is nothing in a name, except that the contents of the exhibition do not quite tally with the title on the catalogue.

Not being able, as we said, to begin at any palpably important work, we will just notice some of the most interesting items in the order of numbering; taking figure-subjects first. Among these, Miss E. Pickering's "Cadmus and Harmonia" (20) claims mention as the only complete and elaborate study of the figure, and as a work aiming at ideal poetic expression. It is from Ovid's Metamorphoses, and represents Cadmus in the form of a snake climbing round and nestling against the nymph who had been his beloved when he was yet in human form, and who has not yet undergone the transformation. Whether these wild fables do so well for painting is perhaps a question. There is something disagreeable and "uncanny" in the actual appearance of an elaborately-painted snake twining about a woman's naked body, and we are apt to be more struck by the disagreeable fact than by the poetic meaning. Otherwise, it is a very beautifully-painted figure, showing much refinement of feeling. It is rather effectively balanced by one placed (with obvious intention of contrast) at the other end of the same wall, Miss Hooper's painting of "The Sleep of Brynhilde" (138), the lady now so well known in London society through Wagner's treatment of her story. Not that this, though a good solid painting of a figure in antique armour, can rank with the first-named work; but it is interesting thus to contrast the heroines of Greek and of Gothic mythology in painting. Going back to our first position, we note, in progress along the wall, Mr. Stock's "Watercress Girl" (31), Mr. Farquharson's "Ready for a Ride" (44), a characteristic half-length portrait of a young girl with her "habit" gathered close about her with very natural action; and we are brought up before Mr. Frank Holl's "Hush!" (68), to consider whether this is real or affected sentiment. There is a companion work, "Hushed" (100), and they represent two episodes in getting baby to sleep, in a cottage interior; the groups in both cases, as well as in a third rather similar work by the same hand, being lighted in a mysterious manner so as to show only the salient angles of figures and furniture brought out by the light; the rest in gloom. And we decide that it is not real, and is an attempt to give an effective appearance to what is really common-place work. We would rather have "A Leisure Hour" (112), by Mr. Hugh Carter, which touches the same class of subject in "the light of common day," and with a simple fidelity, though the painting is rather pleasing than powerful. Two single figures in this neighbourhood give us pause by their individuality of treatment and colouring, and their strong contrast; "Marianina" (94), by Mr. Fildes, and "Reflections" (76), by Mr. O. Scholderer. The former is a sketchy work, very thinly painted, and yet treated with so much power of tone and modelling as to have quite a finished and complete effect. It represents a very buxom, ruddy young Spanish (?) girl of the lower order, with coal-black short hair, standing in an easy attitude with her arms crossed; the tones of her dress are most happy as a combination of tertiaries. Mr. Scholderer's girl is a young lady, seated on a bench, and gazing absently before her, neglecting the book on her knee. In this case, also, a great deal of the interest of the picture lies in the combination of low tones of colour in a very delicate harmony; indeed, this is its chief value, for the young lady herself is not interesting. There is something puzzling about the foreshortening of the left fore-arm, which seems to disappear behind the book in a rather doubtful manner. We may count among figure subjects Mr. Marks's capital picture of three cranes, called a "decorative panel" (80), but which seems to us too much of a picture in the usual sense to be so entitled. Mr. Yeames has a good subject in the old interior where a party are looking at "The Priest's Hiding-place" (125). The two paintings at the top of the room, Mr. Pettie's "Disbanded" (168), a Highland soldier tramping up a snow-covered mountain with a bundle of "loot" on his back, and Mr. Calthrop's "Appeal" (169) are hardly satisfactory; the former is indeed decidedly a sketch, and not a cabinet picture, but has force and character: Mr. Calthrop's is a finished work which means very well; a man earnestly appealing to another who sits at the opposite side of a table and seems unconvinced; it comes near being a very interesting work, but seems just to miss it. The right leg of the listening figure is surely very long. Mr. Rivière's "Poachers" (160) is very successful; the look of intelligence and even cunning in the wretched dog is capital. Mr. Eyre Crowe's young lady cutting "Initials" (208) on a tree is a wishy-washy young person; we would not have cared for her to cut our initials; and M. Lhermitte's "Butter Market at Landerneau" (230) is not up to his mark, though one may conclude so without thinking slightly of it. Nor would we ever have guessed the name of G. F. Watts as that of the painter of "Bessie" (264). The presence of such a work looks as if eminent painters regarded this exhibition as a place to send their stray experiments to: that, again, is quite in controversion of the title of the exhibition. Things which really do come under the definition of cabinet pictures, are Mr. Heywood Hardy's two exceedingly clever little works, "I'm going a Milking, Sir, she said" (285), and "Here we go round the Mulberry-bush" (428); the latter represents three girls dancing round and trying to get their dogs to join them. In the former the historical milkmaid is questioned by a blue-coated man on horseback, whom we have seen before; man and woman, hare and dogs, are all admirable in drawing and character. Then we come to Mr. Napier Hemy's comparatively large work, "Corpus Christi" (292), which is exceedingly interesting, as showing us a very able artist in a class of subject we have not hitherto had from him. The scene is the street of a Mediæval town in early morning, in which groups of figures are scattering flowers and kneeling in devotion; the central figure being that of a high-born lady, who is giving her homage to the festival by scattering flowers over the street. The picture impresses one at first as somewhat unreal and visionary in character; but this impression rather wears off on further study, and the painting vindicates itself as an earnest and thoughtful work, showing a good deal of imaginative power as well as fine colour. Mr. T. Graham has a very clever study intended to represent "Audrey" (323); the figure has a little too much of grace, and a certain rustic coquetry, to suit the idea of the Audrey who was told to "bear her body more seeming"; but there is something naïve and original in it. Another study of a single figure, "The Amateur" (338), by Mrs. Seymour Lucas, a rough-looking rather fantastically dressed man, playing a flute with an intense earnestness of application, is a

good specimen of true forcible realisation of his subject which marks the works of this artist, who is taking a firm position as an able and original painter. "A Doubtful Bargain" (293), by Mr. Walter S. Stacey, and "Les Bons Amis" (332), by Mr. Hennessey, are two clever little pictures; and in the middle of the screen, among several very good things, we find a small work by Mr. Tadema, "A Kitchen Garden" (435), Roman, of course, with two draped figures holding a consultation in regard to the vegetables for some dinner eaten 1,800 years ago. This is in the true sense a cabinet picture, and one of the best things in the room, though but a slight work for this artist, whose name is a more certain guarantee of fine work than perhaps any other at present before us. Two or three of the best works in the room are among those of which one can hardly say whether the landscape or the figures form the predominating interest; Mr. Boughton's "October" (273), in which certainly the principal point is the expressive figure of the son of the soil with the pitchfork in his hand; "The Foundation Stone" (358) by Mr. P. R. Morris, and (still better), by the same hand "A Forest Dell" (83), a small dark evening landscape, where two girls are clambering up a bank in the foreground: we hope this is only a study for a larger picture; "The Farm Road" and the "Shepherd's Wife" (30, 174), by Mr. Mark Fisher; "Water Lilies" (81) by Mr. G. D. Leslie, where the said lilies are gathered by three girls reclining in a punt, "themselves the fairer flowers"; and Mr. Hamilton Macallum's "Caught by the Tide" (31), a very clever, bright, sunny picture, deriving its title from the figure of the bare-legged woman who wades through the water, endeavouring to keep her skirts out of it without infringing too much on the proprieties. The picture reminds us of a wicked anecdote in Thackeray's "Reminiscences of a Tour in Ireland," of a certain place where there were two villages on opposite sides of a river, where the women in wading across the water to see each other had to hold up their habiliments even higher, it is inferred, than the woman in Mr. Macallum's picture, whence the place came to be called "Prospect Ford."

Among landscapes there are a good many nice bits. Mr. Waterlow's "August Moon" (42) has real light in that luminary, besides other merits; his view of a cornfield showing "a rich crop" (274) of poppies is very interesting and forcible. Mr. Macartney's "Lustleigh Cleeve, Devon" (167), is a fine landscape, giving the bare gloomy aspect of the country under certain conditions of weather very finely. In Miss Montalba's "Grey Day, Venice" (207), a little bit of real originality catches the eye; and equally so in Mr. H. Moore's "North Sea" (238); though in each case we seem to find the painter working with a special and perhaps too narrow aim. Mr. Walter Field's "From my Study Window" (236), and Mr. Hennessey's "Old Church at Bonerville" (252) are original little landscapes; Mr. MacWhirter's "Golden Gate" (310), the entrance to San Francisco Bay in a glowing sunset, is a good attempt at a Turneresque effect; and Mr. Aumonier's "River Blythe, Suffolk" (331), has some of the finest qualities of landscape, and a good deal of grandeur of effect, in spite of its comparatively small scale and the simplicity of the materials from which it is composed.

Sculpture, usually represented in these exhibitions by a single figure, is in more force this year, and includes one masterly terra-cotta, of a lady reading, by Dalou; the costume is that of every day, but the dress, falling in broad sweeping folds from the left knee, is treated in the finest and most sculpturesque manner. The marble statue, by Mr. Lawes, "Hesitation," is that well-worn motive with modern sculptors,—a nude figure of a girl afraid to plunge into the water; it deserves attention for its careful modelling, and a certain individuality of character in the contours, but the face is affected, and the attitude of the feet too nearly repeats that of a well-known work. Mr. Mullins's small terra-cotta figures of "Painting" and "Sculpture" show real grace and fancy, and his little sketch portrait in clay of a girl seated is very pleasing. Miss Alice Chaplin has some clever little models of cats (No. 463 in particular), and Mrs. Fennessy makes a bold effort to realise in bronze the figure of Polyphemus hurling the rock, in which the head is treated with considerable power; the legs, however, seem too short for the head and trunk of the figure.

NOTES ON CORNISH CHURCHES.

ARCHITECTURAL ASSOCIATION.

At the ordinary general meeting of the Architectural Association on Friday, the 23rd ult., Mr. Bowes A. Paice, president, in the chair, the following gentlemen were elected members, viz., Messrs. W. G. Penty, M. B. Tenlon, W. F. Grieves, A. F. Wills, J. H. Currey, A. S. Haynes, J. H. Wilson, E. J. Milner Allen, H. Dobie, J. Adkins, W. M. Hodges, C. Tait, F. T. H. Chambers, H. W. Twyman, R. Néjedly, jun., E. Mills, C. M. Burgoyne, T. C. Dalziel, F. W. Kite, J. Brown, A. W. Johnston, H. B. Flood, H. Worthington, A. L. Lovegrove, C. W. Goodchap, T. B. Whinney, F. Stocker, C. A. Poland, and E. W. Charlton.

Fifteen gentlemen were proposed for election at the next meeting.

A letter was read from the honorary secretary of the Architectural Museum, asking the members of the Association to contribute casts of details of "Queen Anne" and other late styles of architecture, so as to add to the completeness of the Museum.

Mr. J. P. St. Aubyn then read the following "Notes on Cornish Churches":—The few remarks I have to submit to you on Cornish churches I propose confining to the examples which have come under my notice in the ordinary course of my professional dealings with them, rather than attempt a description of every church in the county,—a task I do not feel competent to undertake, as there are many I have not had the advantage of visiting, and therefore cannot undertake to describe.

The examples I have met with range from the Norman period (as in the Church of St. Germans) to a date reaching down to A.D. 1664 in the later works (as in the Church at Morwenstow).

The Norman works in Cornwall are not numerous, though there are some fine examples, the most notable being the west front and a small portion of the interior of the Church of St. Germans, a scale drawing of which, and photographs, I show. The other examples with which I am acquainted are the south doors of Kilkhampton and Morwenstow, both fine examples and in the same remote part of the county. At Tintagel there are considerable remains of Norman work.

There are also examples of Norman doors at Cury and Mylor, both small, and situated at the other extremity of the county. At St. Germans, North Petherwin, and St. Breward, portions of Norman arcades remain, massive in proportion, but built of small stones; and here I would remark that, as far as I am aware, granite, although a very abundant material, and at hand, was not used in church building till the sixteenth century, the probable reason of this being the difficulty of working so hard a stone with the tools and mechanical appliances then available.

The building-stones mostly used for this Norman and all the periods so late as the Second Pointed or Decorated, were the slate stones and elvans, both very good workable and useful building-stones, and abundant throughout the county. The elvans vary in every degree of texture and colour, from almost black to a light grey. Caen stone, and Bere stone from Devonshire, were also frequently used for windows and other ornamental details. Serpentine rock has been largely used in the Lizard district.

Early English or First Pointed work is certainly very rare in Cornwall. I know of only a few examples, one being the fragments of a double lancet window in what is now the breakfast room at St. Michael's Mount, and which was brought to light a few years since; and a few single-light lancets are occasionally met with, scattered about the county.

The transepts of the churches which still, either in part or wholly, retain their original cross-shape, appear to have arches of this date; they are very simple and rude, being nothing more than depressed lancets with slightly-chamfered vousseirs and jambs, with a rude impost-moulding, as may be seen at St. Minver. The north arcade of St. Minver, and the arches of the chancel aisles of St. Austell, are possibly of this date. The piers and arches of St. Minver are built of very small stones. The former are octagonal on plan, and the arches of two orders are square, with slightly-chamfered angles.

The Decorated or Middle-Pointed work is more abundant than that of either of the two preceding periods, and is of great interest. Windows, doors, arcades, and minor features are numerous and well defined. The windows have a character of their own, and a mode of treatment not met with in other districts. Examples of this are to be seen at St. Germans and St. Columb Major. The arcades vary in treatment from the early and simple example at Fowey, to the more elaborate specimens at St. Enodock and St. Columb Major.

The only example of a Decorated tower that has come under my notice is that of St. Neot. It has massive buttresses, and windows of simple tracery, and either had, or was intended to have, a spire, the springing of which is very apparent.

The church of Lostwithiel is a notable example of an open spire of this date, but I have not had an opportunity of examining it. The steeple of St. Hilary is a plain example of this period.

An excellent article by Mr. Street, on the Middle Pointed work of Cornwall, with numerous illustrations, will be found in vol. iv. of the "Transactions" of the Exeter Diocesan Architectural Society, to which I beg to refer you.

Having called your attention to these early styles, I now come to the Perpendicular, or Third Pointed period, reaching down to 1664, as at Morwenstow, which has this date on one of the pier caps of the south arcade. To this period the greater number of the Cornish churches belong, though mostly grafted on buildings of much earlier date, and of cross form; and so similar are they in plan, elevation, and detail, that this may be fairly said to be the typical Cornish church, the characteristics of which consist in the nearly equal length, height, and width of the nave and chancel, with their aisles; in the almost universal absence of a chancel-arch; in the long, slender, and monolithic pier-shafts, sometimes merely octagonal, but mostly moulded; in the depressed arches of four centres, and moulded, of small span; in the low pitch of the roofs (seldom exceeding 45 deg., often less); in the cradle or wagon shape of the roofs internally; and in the depressed window arches and usually plain tracery of three lights, often without cusping.

In this period granite is largely employed, either native, or imported from Lundy Island. Clear-stories are very unusual, but they occur at Fowey, Lostwithiel, and North Petherwin. The chancel, as I have before mentioned, was seldom separated by an arch. The nave and aisles were parted from the eastern part of the church by handsome and elaborately-carved oak screens, few of which remain, but the stumps which have been spared indicate their position, and give an idea of the beauty of the destroyed superstructure so ruthlessly removed. Remains of colour and painting are to be found on these screens, which supported rood-lofts, the stone stairs to which in most cases are remaining. The chancel fittings have in almost all cases disappeared. In the Collegiate Church of St. Burian only have I seen a few fragments of the stalls and miserere. But the church benching has fared better. Much of this work remains, and in some cases in good condition; but in a large proportion of churches it has been ruthlessly destroyed and replaced by the meanest description of deal framing in the shape of "square" high pews.

The roofs, screens, and benches appear to be of the end of the sixteenth or early in the seventeenth century. The benches are elaborately carved, generally with a running border of fern-leaf and foliage, and, when not panelled, the centre of the bench-end is covered with emblems, arms, crests, initial letters, and monograms. The benching at Morwenstow is dated 1595.

The roofs of these Late Perpendicular churches are of "square" 45-degree pitch, and constructed in the cradle or wagon form, divided into panels by moulded ribs and side-pieces or purlins. The intersections of these ribs and purlins are covered by large carved bosses of foliage. The wall-plates, ribs, and purlins are very frequently enriched by a running pattern of fern-leaves, but ordinarily they are merely moulded. They were never ceiled with plaster, but, in some instances, over the altars were underboarded and illuminated with gold and colour. These roofs, although containing a large quantity of timber, and possessing much beauty, are not particularly strong in construction. The component parts are numerous and small. They are without longitudinal ties, and depend for their stability on the soundness of the tenons and mortises. If from any cause these failed, the construction soon fell into ruin, as has been the case in too many instances. The slate-laths are nailed immediately on the backs of the rafters. On these laths hang the small slates locally called "scantles." They are bedded in mortar, and unless the timbers are underboarded, the slating was

exposed to view from the inside. The plastered ceilings taking the curve of the ribs, now so common, are quite modern additions, and intended to exclude draughts, which followed on the dilapidation of the construction of the roofs and gutter-leads. It is plain to see, also, that as soon as the failure or decay of the mortises and tenons, and the oak pins which secured them, commenced, the timbers subsided and had a tendency to thrust the wall-plates outwards, and to drag the slender arcading with them. To this cause the leaning position of so many of the arcades may be traced. I need hardly add that all the roof-timbers are of oak, the curved branches of the tree being brought into use in forming the under-ribs of the framing.

I have before alluded to the original cross-shape of nearly all the Cornish churches; some still remain so, notably the interesting church of Tintagel, a Late Perpendicular tower being the only addition to the original planning. Most of them appear to have been subsequently altered from their original form to that of aisled churches, thus: the limbs of the cross have been removed, generally both, sometimes only one; and then, usually on the south side, an arcade took the place of the old side walls, new side walls being built further out, and extending the whole length of the church.

The Church (now the Cathedral) of St. Mary at Truro, and St. Mary's, Launceston, deserve particular attention from their unusual richness of detail; that of the latter is cut in granite, and very perfect; that of the former in Pentnan stone, and much decayed.

The towers of the Cornish churches, particularly the late ones, are characteristic. They are mostly of granite, excepting where this material is very distant. Massive in design and construction, when buttressed the buttresses are slender, and obviously not intended for support; but more frequently there are no buttresses. Sometimes the pinnacles are square, but often octangular, rising considerably above the battlements.

The tower of Fowey Church is a fine example, 100 ft. high from the ground level to the top of the battlements. It is highly embellished with well-cut ornaments of Pentnan stone. Probus, said to be the most lofty tower in the county, is of fine proportions, but I believe not higher than Fowey. The tower of St. Austell is also a fine and elaborate specimen. There are likewise many fine towers in the north-east of the county. The tower of Maker is fine, and the walls are of the extreme thickness of 5 ft. 6 in., built of granite.

The spires are not numerous or striking, and do not number twenty. Lostwithiel, however, deserves attention from its peculiarity of design and construction.

The fonts, some of which belong to the Norman period, are of very great antiquity and interest. They are of almost every variety of shape and description of stone. Granite is not a common material in use for fonts, and mostly they are of earlier date than the Third Pointed period.

Pulpits of early date are uncommon. A stone one occurs at Egloshayle, which I believe to be the only example in the county. I know of no wooden ones worthy of notice.

A few fragments of wall painting of interest have occasionally been found, under successive coats of whitewash. I have met with no specimens of encaustic tiles.

Of metal-work, a few good examples of monumental brasses remain, the most notable being at St. Columb Major and at Stratton. The damp climate, added to neglect, has left very few examples of ironwork.

Painted glass, owing to the neglect of the Cornish churches in former times, is not common; but a notable example remains at St. Neot; and there is a good window at St. Teath, nearly complete. A few fragments are to be found dotted about the county.

I have now put before you, imperfectly, I fear, the facts that have presented themselves to my notice in my dealings with these Cornish churches, and in which, naturally, I take a great interest. I hope I need hardly add it has been my aim to preserve their ancient features, and to be as conservative as the exigencies of the several cases admitted of. I regret I have never been able to replace one of the oak cradle roofs when its state has made it necessary to substitute new, by reason of their great expense, and the extreme difficulty of finding oak for the purpose within a limited time; and workmen in sufficient number and skill would not be forthcoming to carry the work into execution without importing them from a distance at a cost which cannot be met by the funds usually raised for the repairs of a Cornish church.

From what has been stated, you will see the close resemblance one church has to another, and how this family resemblance extended not only over the whole of Cornwall, but far east into the adjoining county. It would seem as if one design (if I may so speak) was used throughout the district, giving the modern architect a lesson, I venture to think, to be not too anxious to build his fame on the variety of his designs, but rather to follow the example of the men who built these Cornish churches.

Having concluded the reading of his paper, Mr. St. Aubyn devoted some time to *vivâ voce* explanation of the large number of illustrations on the wall, many of them being his own working drawings and sketches made prior to and during the restoration of some of the churches named under his direction.

The President (Mr. Paice), Mr. W. F. Potter, Mr. H. W. Pratt, and another member, having made a few remarks, Mr. St. Aubyn answered a number of questions asked by the speakers, and the meeting terminated after passing a vote of thanks to Mr. St. Aubyn for his interesting paper and its accompanying illustrations.

WANDERINGS AND QUESTIONINGS IN ARCHITECTURE AND ART.

ARCHITECTURAL COMPOSITION, WITH SPECIAL REFERENCE TO GENERAL OUTLINE.

COMPOSITION should be arranged with an eye to broad and powerful chiaroscuro, which is part of composition and dependent on it; and to produce an outline more or less pleasing with due respect to the proper character of the subject.

The expression of the latter being the primary object and generating cause of composition, the mind as well as the eye has to do with the appreciation of every architectural group, and will be gratified in the degree in which it is satisfied of its fitness for its practical purposes, including the more immediate and structural ones of throwing off water, resistance to and the affording shelter from the elements, the primary idea of all architectural forms, and the fulfilment of the divine laws of health.

It should be unnecessary to say that architectural compositions must differ according to their rank and proper character and destination. Municipal buildings, for instance, from palatial, political from collegiate, and so on; as in sculpture, the beauty of the Apollo is one kind, that of the Hercules another; while the Venus differs from the Diana, and the Minerva from both. And we give these various distinctions of character by the same means as Nature does, by different qualities of form, which must, independently of education or association of ideas, have a connexion with corresponding emotions of the mind.

A good bounding line is said to be a leading exigency of sculpture "in the round." I believe it is equally important in architecture. But that this may be obtained consistently with truth or fitness of character we may be assured if we consider how vast and varied are the forms and proportions of Nature's chief structures, man and the lower animals, within the sphere of the beautiful. How different, for instance, the proportions of head to body, in different creatures! The lion owes his grandeur mainly to the enormous preponderance of the head and limbs over the small body, as some birds their grace and elegance to length of legs and neck. There is scarcely a plan or arrangement, horizontal or vertical, dictated by practical utility, but what may be wrought up into fine and characteresatic forms. Infinite are the solid shapes in which composition may present its subject to the eye. Ask not, says Fuseli, what is the shape of composition, meaning that it cannot be defined and must not be restricted to any particular character of form. It is not confined to the spire-crowned mass nor to the dome-crowned mass, to the group of three spires, as in some approved Gothic piles, nor to those of three or five domes, as instanced by some very picturesque Classic and Byzantine compositions. Composition is the shape of every beautiful thing that waves in the summer breeze or gleams in the eye of day: trees,—the oak, the chestnut, the larch, the poplar,—flowers, crystals, birds, beasts, mountains. It is the shape of flame, of rocks, of the vault of heaven, of the human head, all of which objects architecture may emulate, as she may take hints even from purely moral and intellectual conceptions; building materials, statical and dynamical science, laws of the resolution and resistance of forces, are all sources of suggestions, analogies, and principles of forms, proportions, or arrangements in architectural composition. Composition may be as simple as a Greek temple, or it may resemble a forest or mountain-chain in complexity, and yet be pleasing and satisfactory. The latter seems to have been the feeling of the Romanesque architects of Germany, whose numerous groups of spires are among the most picturesque objects to be found anywhere.

Every building should, however, in its general ideal outline be more or less suggestive of the pyramid. No building should be an absolutely square or parallelopiped block, or without some general diminution upwards, or rise in the centre, which latter provision against weather renders needful in northern latitudes. I say this advisedly, though aware it is condemnatory of many fine and otherwise meritorious structures.

As of all forms that of the pyramid is most fitted to resist the force of gravitation, these requirements are paramount to the laws of decorative style. Some styles are more aspiring than others, and will take a pyramidal form more readily and naturally than others. But buildings of all kinds are under obligation to assume a general pyramidal outline, though it may be of lower proportions; and in cases where an upright wall is desirable for its greater impressiveness, or otherwise necessary, yet the spirit and principle of the pyramid should be kept in view, and the mass rendered really lighter upwards by the increase of openings and multiplicity of parts of each story to the top, which was a beautiful characteristic of many Mediæval buildings.

Some approved compositions are a group of various pyramids rather than one, under one general pyramidal outline, an excellent example of which is the group of towers of Laon Cathedral, in France, a second is the Church of the Apostles at Cologne. Such complex compositions belong to the Romanesque period of Germany; the productions of the Pointed style there and elsewhere being nearer the single pyramid in general outline. They would have been nearer to it had they been finished, which many Gothic buildings are not, but imperfect from lacking the spires or lanterns of the great central mass,—a fact that has not been borne in mind; for they have in this state been imitated as models of composition, while the few finished compositions we have have been unheeded.

The highest feature of a composition should be, as in these, the one nearest its centre, which in the cathedrals is the tower marking the intersection of nave and transepts. This prevents distracting equality: round the centre spire the other portions of the building circle in subordination, producing a general composition which satisfies both eye and mind. This is by no means the case when two west towers, or any other two equal masses are the principal features of the composition; and there is no commanding third one to render them secondary. The Church of St. Sulpice at Paris, Greenwich Hospital, and Westminster Abbey are examples of this; and, if I remember rightly, some of the published designs for the new Edinburgh Cathedral.

Of the terminal or crowning features of a composition, the most beautiful are the curved or dome class, and the lantern species, or those wherein tower and spire are blended. But the spire alone piercing the blue deep, well united to a broad tower properly subordinated to it as its base or pedestal, gives great spirit and animation to a building, far more than the finest tower, which latter may in some measure be redeemed by the going up of an angle turret, or by a visible, high-pitched roof,—a feature too seldom seen. The combined tower, lantern, and spire may be carried to the utmost limits of architectural elegance, and show an exquisite grace and delicacy of outline. It belongs to the very nature of such objects designed to please the eye only, and unrestricted by considerations of utility, to admit of a beauty almost dreamlike, and in some instances display forms which, for fairy-like delicacy and grace of outline, the spectator would expect to see vanish from his sight. It belongs also to the nature of such objects to exhibit as a class an almost infinite variety of design: spires should differ in a town in aspect and character as much as trees in the country.

But might we not see in steeples a greater variety of position with respect to the body of the church? Might not the towers of city churches be placed more frequently behind,

nearer to the chancel end, so as to leave the front in each case symmetrical or uniform, over which a tall spire has a more poetic effect than immediately abutting on the street? A variation of the kind as it would affect the general arrangement might lead to some fresh and equally pleasing and convenient forms; and it must lead architects to the discovery that there is more scope for varying on foregone types than they are allowing themselves, and to an occasional departure from the clearstory and side-aisle section, which every true and enlightened friend of Gothic architecture would be delighted to see. It might lead sometimes to designs exhibiting a noble elevation of wall and a series of lofty windows enclosing a simple undivided interior, an arrangement to which the Gothic style would as readily bend as to the clearstory.

It seems to be taken for granted that ecclesiastical edifices should be invariably spired or domed, while all other buildings may either be so or not. But it appears to me that every great or public building, of whatever class, is under equal obligation to rear a crest of some kind above the crowd of houses, for which the architect may find ample occasion or pretext even in provision of a useful feature, or to increase the height and dignity of a centre hall, or give height to it clearstory-wise.

If I am right in this, many otherwise great buildings are imperfect compositions; behind, strange to say, in this important particular, the works of semi-barbarous nations, reared while architecture as a fine art was yet in embryo.

The great united palace of the Louvre and Tuileries, even though it properly makes the roofs an important feature, and sets a good example with reference to chimneys, which are as necessary to the expression of a royal palace as to a cottage, yet wants a loftier central mass. It has one block that goes higher than all the rest, but not high and commanding enough to give unity to so vast a building horizontally. The Palace of the Vatican would have been in a worse plight but that it appears as a vast wing of the church, the dome of which unites all. Our National Gallery and Somerset House are redeemed by their domed towers, though mean objects in themselves, from this flatness. That all such buildings, consisting of several masses, should have at least one of them forming a larger body in the centre surmounted with a tower is suggested by the analogy of animal forms, more especially those of birds, consisting of body, head, and wings; and the value of such an elevated feature breaking the sky-line may be judged by the spirit and unity which a very slight spire often gives to a great pile; witness the effect of the wooden spirelet over the huge body of the French Cathedral of Amiens, which brings, as it were, its numerous aspiring features to a focus above. Nay, a flag, or even flag-staff, on the top of a square building or tower, not only gives life and spirit sometimes, but dignity. And what, on the other hand, would give a more crestfallen, mournful aspect to a city than beating down its domes and spires and reducing it to a level sky-line?

Some secular buildings of course have higher demands in this respect than others. Palaces, Government offices, museums, art-galleries, public libraries, and what may be termed the homes and shrines of moral and intellectual institutions have more claim, or should have crownings of higher character than workhouses, infirmaries, and lunatic asylums,—a principle that has not been acted upon, for we often find buildings of the latter class which ought generally to wear a lowly air, and which a quiet, humble mien would best befit, show a prouder bearing and more aspiring character than edifices of the very highest destination.

Connected with this subject is the lesson taught us by the discovered upward convergence of the axes of the columns of the Parthenon, a practice which is not only necessary to correct any appearance of overhanging, but to give a little of the look of pyramidising. Set-offs, too, are also an important means of effect in composition. Nor are they less necessary in Classic than in Gothic architecture. They give life and grace to all classes of erections, from the cottage to the cathedral. Pyramidising more or less is essential to unity with the ground. It gives a building the appearance of growing out of the ground; and the mention of this unity reminds me that in all buildings, more especially large ones, it is necessary that one horizontal cornice, entablature, or string-course, at least, should unite all the different masses in its embrace. This is a very important principle: a composition may consist of a number of rich and beautiful parts, and yet be very poor in design and effect unless properly bound together. The London University building, in which the centre or head seems an insertion between two dissevered parts of the body, is a case in point. The National Gallery, Edinburgh, is another. I may be told of the Erechtheium at Athens,—a building that has been praised for the discontinuance of its entablature. I believe that no praise is due to it for this, which is probably the result of accident, or some special cause,—not design. But however it be, as Allison, in his "Essay on Taste," says,—"In all the fine arts, *that* composition is most excellent in which the different parts most fully unite in the production of one unmingled emotion; and *that* taste the most perfect where the perception of this relation of objects, in point of expression, is most delicate and precise." The whole composition should fill the eye at once; but there may be receding and partially concealed parts or recesses, where the imagination may revel, and enhance the general effect to the mind by ideal and unseen beauty. A similar effect is produced by the intricacy of the forest of buttresses and flying buttresses in the great Gothic cathedrals, which, though sometimes inveighed against, I believe to be a beauty in that style of architecture.

In this general effect of a composition, an eminent part will be played by its accessories, the design of which is an important matter, as the effect of a building may not only be greatly enhanced, but greatly reduced and injured by its adjuncts and outworks,—like a master ruined by the misconduct of his servants.

A composition must be influenced by its situation, to the avoidance of hopeless rivalry with nature. Spired and domed compositions, for instance, are only suited to a champaign country, where there are no corresponding forms in the shape of mountains or peaks within sight to dwarf them. Domes of 50 ft. or 100 ft. diameter can have no power to charm or awe among those of 2,000 ft. And it would be well to emulate the Mediæval architects in the marvellous ingenuity with which they adapted each edifice to its particular locality,—river-side, hill-slope, or wooded dell, and with which they adorned it with those poetic and touching objects which Nature so lavishly contributes to such scenes; which suggests that public buildings in cities should be adapted also to the general character of the architectural scene they are introduced to, and not allowed to look so lonely and anomalous as they often do for want of kindred buildings to unite them to the ordinary architecture; as if they had strayed from their proper place. Nor should there be the irreverent crowding of private and ordinary buildings on public and important ones which we sometimes see, especially on places of worship, which ought to stand detached from every other building.

In composition, more than in any other part of architectural design may be exercised the inventive faculties of the architect to the production of new forms and lines based on nature and the intellect; and these faculties may be variously stimulated,—by peculiarities of site, or new building material, for example, or some singularity of requirement or condition, as a religious prohibition,—a circumstance which led to great originality in the Saracenic architecture. Leonardo da Vinci avowed that even from the stains wrought by time on old walls he obtained many excellent hints.

But I believe architectural composition may be most advanced by the study of really great buildings, however imperfect or mutilated they may be by time; that is, by the action of the creative power of the imagination upon them, idealising them, supplying their deficiences, repairing their defects; inspired by the natural love of, and desire for, the perfect; glimpses of which we catch from a contemplation of what in itself may be imperfect.

Literal imitation is the bane of art, and produces, not merely stagnation, but retrogression; but what I here suggest is an intellectual imitation, imitation of the principle on which the beauty or grandeur of a work has been achieved,—emulation of its spirit and fire, by one who is conscious of power to avoid being seduced into error as to what are beauties, by the authority of antiquity or the brilliancy of a great name. The loveliest Madonnas of Raffaelle and Guido Reni were drawn from the divine forms of the antique animated with the glorious flesh-tints, blue melting eyes, and flaxen hair of the Italian women of their day; or, in other words, from the best living models they could obtain, corrected by the Greek ideal,—and so probably the highest conceptions in architecture might be reached from extant productions of the art,—idealised or perfected by the restorative and inventive powers of the imagination.

The most costly element of architectural perfection is the sculptural embellishment. A beautiful building, embodying rich subtleties of thought, and full of life and expression, can be produced without it. But the highest class of architecture must be indebted to the highest class of sculpture, which, as the superior and more phonetic art, cannot fail greatly to elevate the other. The importance of sculpture to architecture has been by one writer, I think, overstated. But in England, by English architects, it has practically been as much underrated. Placed in juxtaposition with some Italian buildings profusely pinnacled and adorned with statues, some of our finest architectural compositions would have a poverty-stricken, starved appearance, and excite regret that architecture should so lack its natural aliment. Duly adorned with statues of an imaginative and creative character, how much more harmonious would many of our finest Anglo-Classic façades become with every object of nature that can be seen in connexion with them? How much more harmonious, even if nothing but the sky, with its fleecy clouds, were visible along with them? Architecture properly attuned to and duly supplemented with high-class sculpture is like poetry set to music. So combined, the two become more emotional, more powerful, and eloquent.

Samuel Huggins.

GATESHEAD-ON-TYNE.

Gateshead has shared the fate of many a place the importance of which, dwarfed by a larger neighbourhood, is overlooked. Separated only by the river Tyne from the larger and older borough of Newcastle, it has received less than the attention demanded by its own importance, the extent of its trade, or the variety of the industries which are centred in it. Its growth in the present century has been rapid, and not only has it advanced in population, but also in the extent to which it has influenced the district and contributed to the development of the industries located on the southern bank of the Tyne. Down to comparatively recent days it was composed chiefly of three streets,—one, the High-street, "formed by a number of houses clustered on both sides of the road leading to Newcastle," and the others running parallel with the river and joining the main street at the southern end of the bridge. Thus situated and dwarfed, as noticed, by the overshadowing presence of the great Tyne-side town, Gateshead was little named or taken note of, and one of the references to it in contempt dubbed it a "dirty lane leading to Newcastle,"—a sentence which, without the uncomplimentary adjective, expressed tolerably generally the opinion formed of it. There are references to it occasionally, but usually, prior to the time of its acquiring direct Parliamentary representation; the notices of it are to the effect that its government was vested in a bailiff under the Bishop of Durham; that since 1695, stewards elected by the borough holders and freemen had governed it; that petty sessions were held; and that its church was "an ancient edifice, the living being in the gift of the Bishop of Durham." The benevolent institutions would be named, the shoe-fair glanced at, and the whole dismissed with the statement that in 1821 the population of the parish was over 11,000. Those who would describe Gateshead now find greater facts to chronicle.

Its population has bounded forward from 11,000 to 15,177 in the first decade after the time named; and thence, by successive steps, until, in three decades, the last number was doubled; and at the last census, its population was over 48,000. Nor was this all, for it had largely contributed to the growth of the population of the neighbouring villages; and in the union of which it forms the chief part, the population was raised from 59,409 in 1861 to 80,235 in 1871. As one result of this accompaniment of increased population, an increase of pauperism is known, and Gateshead has now in the bounds of its union 330 indoor and 1,944 outdoor paupers; but as its pauperism is to its population at the rate of 1 to 35, it is,—although worse than the average of the whole of the north-eastern district,—by no means the worst of surrounding unions. Turning to its own more proper

limits, it may be said that its borough includes 3,243 acres, which held at the last census 6,386 houses. Another accompaniment of a large population is criminality, and in a year about 3,000 persons are proceeded against—a usual proportion giving over two-thirds to the male and one-third barely to the female sex. A third of the crime is furnished by drunkenness; and crime of not the most heinous nature takes up the chief of the rest, the serious offences being comparatively few. The large population in the wider bounds of the Union furnishes nearly 4,000 births and 2,600 deaths yearly. It also furnishes about 180 insane people, tolerably evenly divided between the sexes. And in the lesser limits of the borough it has raised the roll of the burgesses to about 12,000.

Gateshead as an industrial centre occupies no mean position. It had established, about a hundred and thirty years ago, its chief iron-works; and as the years have passed they have grown; and they now include rolling-mills, engine-works, chain and anchor foundries, and other allied industries of great extent. Authentic figures a few years ago stated the number of workmen employed at over 1,500, credited them with the manufacture of 150 marine and land engines, and estimated the value of the work then turned out at 225,000*l.* yearly. Next, the vast works of the North-Eastern Railway may be named, in which some 2,000 workmen are employed; and in which the building and repair of a large part of the engines at work on that immense system of railway is accomplished. The works of Messrs. Abbott & Company are also large, hydraulic machinery, anchors, pipes, &c., being amongst the special manufactures of the firm. There are large chemical manufactories centred at Gateshead, and the subsidiary but very important industries include glassworks, shipping, &c., whilst the adjacent and early noted collieries and the shipbuilding-yards contribute materially to the prosperity of the borough. In some of these later trades it is impossible to define exactly the extent of the trade of the town, for the figures which would have told it are hidden in the total of the associated towns of Newcastle and Gateshead, or in the vaster total even representing the trade of the many places which contributed to the greatness of the Tyne. In many modes the boroughs are united, and in many official documents Tyne trade is given as a whole, so that the proportions of each contributor are not always ascertainable. But that of Gateshead, it may be said, is great and growing, as well as in some respects of early date. The Tyne has long been the home of the northern chemical trade; its course for long distances is through the heart of the richest and best esteemed part of the northern coalfield; and alike on both banks its contributions to the output of northern metallurgy have been great and varied. Glass, earthenware, and paper are amongst the manufactures for which it is noted; the tanning trade has been long established; and engineering and other trades found an early home on the banks of the Tyne. To these and others Gateshead has contributed. Sailing down the river we may notice traces or indications of the presence not only of the parent coal and iron trades, but also firebrick and colour-works, glass-works, paper-mills, timber-yards, soap, cement, and chemical works, whilst coal staiths, foundries, engine-works, and shipbuilding-yards are so near as to form practically a part of the great whole, which extends its boundaries yearly.

The trade of the Tyne has suffered in one or two respects of late, and there may be marked on both sides in the voyage from Shields to Newcastle silent furnaces and works, whilst the collieries near, as is well known, have felt in some degree the force of the great general as well as local depression in the coal trade. It is by no means a certainty that the iron trade on the Tyne will know the prosperity again that it once knew; for its blast furnaces are not of the newest or most productive type, nor are they most centrally situated, so far as the supply of ironstone in large quantities is concerned. The local coal trade knows also the result of the increased competition between the various coal-producing districts of the kingdom, and knows also that some of its early-famed seams are worked under conditions more unfavourable than was once the case. But there are now being applied, if not remedies, at least palliatives of the evils engendered by the latter state of affairs, and there are attempts to work the coal-seams in more economical modes in the future than in the past. For the future of the coal trade there is confidence, due alike to that fact and to the repute of its product. On that trade is built up the exports of the Tyne largely, but her imports are giving to her a vast and extending trade in other directions; and guided by the capable men who have long controlled the destinies of the river, there has been increased use made and advantage taken of the great natural endowments she is possessed of, and the vast stores of treasure-trove in the shape of minerals that are laid up in the bowels of the earth,—stores of power representing the accumulated solar energy of ages. To the development of the export and import trade of the Tyne, Gateshead has contributed a full quota; and she has,—in increased wealth, in increased trade, and enlarged extent,—fully reaped a corresponding benefit. Founding her trade on the great staple of the district, and adding thereto others which, from position or abundance and cheapness of material, she can favourably add, there should be for the second town on the Tyne a future relatively as great as that for the older sister. It is evident that her facilities are not yet fully developed, and it is also evident that she has in some respects been in the shade which the greatness of Newcastle has made; but using aright the advantages of her position, and the fuller facilities of trade which are being given to her river, there should be an advance yet before Gateshead as great as that which has been known in the later years that have passed of this century.

THE BUILDING INDUSTRY OF PARIS.

For several years the French Chambers of Commerce have collected and published a series of valuable reports upon the industries of Paris, and the latest is not the least interesting. It applies to all branches of work; but it is possible to take a special view of each, so accurate and distinct is the arrangement. There are, indeed, ten groups distinguished, among which one,—that of building,—occupies a prominent place. If we rank these ten industries according to the amounts of money expended upon them, we find it fourth in degree, food, clothing, and miscellanies for which Paris is celebrated beyond all cities in the world, taking precedence. It would stand far higher on the list were it not, in fact, for the immense architectural extensions and enterprises undertaken and completed by the Empire, when the quarries in the neighbourhood of the capital almost failed to supply materials for the stonemason. Still, in point of individual earnings, the building operatives keep the lead, and are likely to keep it indefinitely. Only a short time ago, we are told, such a revival took place in the trade that 30,000 extra workmen had to be sent for from the provinces, gigantic structures rising everywhere to employ them, and that was long after the exuberant period of Imperial magnificence. The circumstances under which these men labour, however, are not of the best, though their wages, judged by the Parisian standard, may be liberal enough. Where their task lies, there, of course, or near it, their dwellings must be, and they who construct houses are themselves often almost houseless, unless they can afford to pay rents such as sadly detract from their other means of living, and this is more especially true in the palatial quarters, where, frequently, not a nook remains,—not a cellar, not a garret, for the artificer of any class, within reasonable distance of his employment. It is not so, however, with other trades. The cabinetmaker has his traditional home in the Faubourg St. Antoine, and the bronzer and goldworker in the Quartier du Temple, just as metropolitan watchmaking used to have its centre at Clerkenwell, and silk-weaving at Spitalfields; but the builder must be by turns everywhere between the Arch of the Star and the Mount of Martyrs. To make it worse, we must bear in mind that Frenchmen, as a rule, detest walking, and no great accommodation is afforded by the few lines of local railway, which are generally, moreover, devoted to excursionists and pleasure-seekers, rather than to the industrial classes. Again, the experiment of the "Masons' villages," tried a few years ago at Marly, was anything but a success. There was too much of patronage and too much of restriction about it; and Paris, in one respect, has recently begun to imitate London by dividing itself into exclusive sections. Formerly,—and that not long since,—the Parisian workman of any grade, might be seen emerging, with his basket of tools, from imposing edifices on the boulevards, where a nobleman or wealthy merchant occupied the lower floors, while an artisan ensconced himself in the attic. Gradually, however, the two banks of the Seine have been taken possession of by an entirely different description of people. It is true that, in the vicinity of the great market-places, a considerable proportion of mechanics is lodged to this day; but even these are giving way before the march of new streets and the multiplication of showy warehouses. The habit of constructing enormous central edifices for purposes of trade, has grown into a passion in the French metropolis, and before long there will be very few small shops or tenements of any kind left in the city whose sky-line continues rising year after year. At one time these changes would have been nearly impossible. The masons, stone-cutters, plasterers, and "mortarers" of Paris constituted a powerful and favoured fraternity, whose interests were particularly consulted by the municipal authorities. From them, however, the living generation has inherited some institutions of signal value,—a special school among them for the instruction of young stone-cutters in those arts of design appertaining to the trade, and whose results are seen in the innumerable façades and arcaded roofs which so sumptuously adorn the city;—for, like the Florentine, the Parisian architect not seldom invites the Parisian workman to his councils. The marble-workers possess another similar establishment, chiefly supported by the municipality, and upon the pediment of its temple is inscribed the legend: "True Work is True Art."

A suggestion, however, is made in the memorial, with reference to the stonemasons, that it would conduce far more to the convenience, and even safety, of the Parisian thoroughfares were all this kind of preliminary industry in connexion with the building trade carried on, not merely beyond the old circle of the barriers, but outside the great masses of the population altogether. This, we are reminded, would get rid of a vast amount of dust, din, obstruction, and danger, and the remark is applied, also, to the elaboration of marble, alabaster, and serpentine,—processes belonging properly to the workshop. No doubt it is undesirable to have so much work done as is done in Paris on the very pavement itself, incumbering it with masses, rough from the quarries, so gigantic that they might have contributed to the external facings of a pyramid, not to speak of the eternal ring of hammer and chisel, and hissing of saws, in new and improving neighbourhoods; but the point is of no great importance, far less so than that a popular industry should feel at home in the city which feeds it. The report cites, upon this subject, the example of the carpenters, whose principal *ateliers* are in the suburbs, and who bring the results of their industry ready to be put in frame upon the spot,—an observation not to be universally applied. The varieties of fact, indeed, connected with this topic, may be inferred from one of a most typical character, which is that the wages of the class under notice range, like those of the Parisian cabinetmakers, from 5*d.* to 15*s.* a day, though both of these extremes are rare,—the former more so than the latter. The memorial to the minister then goes on to discuss the question of improved abodes for this order of artificers, dealing with the difficulty of so placing the workman that his work shall be moderately near to his hand. It dismisses at once all the schemes of model cottages—if such a word as "cottage" has ever been really naturalised in the French language,—and applies itself to such "floors," containing kitchens, bedrooms, and sitting-rooms, within the guardianship of a single door, with invitations for special plans to be judged of at the Great Exhibition of next year. There is no possibility, under the circumstances, they admit, of persuading builders or speculators to abandon the old system of "many-storied barracks," or, as Dr. Veron styled them, "perpendicular streets" with "thoroughfare staircases," a habit ingrained in the Parisian nature, leading to economy in ground-rent, it is argued, and cheapness of construction at the same time, though the consequent heaping up of population must conduce to bad conditions of life. But the available space is small; land is excessively dear; rents are equivalently high; and a miracle might as well be expected as any approach to adopting the Chinese one-floor or the Dutch four-room system. The solitary hope expressed is, that in the typical eight-floor Parisian house, often inhabited by ten or twelve families, the rooms dwindling as the ascent grows higher, until, at the summit, sitting-room, kitchen, and bedroom, with coal-hole and cupboard, cellar and potato-store, are contained within four narrow

walls, some improvements may be made in the future such as are manifestly necessary now. If, say the writers, "the architecture of Paris is a valuable school in itself, there is a great deal to be learned in it yet, and the workers upon it have also themselves in a considerable degree to teach. The one necessity cannot be dissociated from the other; the building is a reflex of the builders,—from the architect to the humblest mason." The memoir is interesting from many points of view, but especially in so far as it represents a great industry of Paris perennially developing itself, since in that city, as in London, a vast amount of reconstruction is incessantly going forward. "The builder," says M. Jonveaux, "signifies Paris progressing." A little truth may here be lost for the sake of epigram; but the truth is not entirely absent, nevertheless.

NOTES FROM MANCHESTER.

The Central Free Library.—The work necessary to be done in order to adapt that portion of the old Town-hall, King-street, which has been placed at the disposal of the libraries committee for the purpose of a central free library, is being pushed forward. The apartments of which the libraries committee have taken possession are the large hall, the room which was used as the council chamber, the mayor's parlour, a smaller room which was used by the mayor as a private parlour, and the hallkeeper's room. These, with the addition of other space which has been secured by blocking up the corridor leading from the head of the main staircase to the mayor's parlour, form the space at the disposal of the librarian. According to the *Manchester Courier*, the alterations which have been carried out are principally in the large hall and the council chamber. In the former the dome has been opened out and glass inserted, and it is by this dome alone that the main room is lighted during the day. All the windows and all the doorways, with one exception, have been closed up, by which means a large additional shelving space has been secured. In the council chamber, a false ceiling, which had been erected to improve the acoustics of the room, has been removed, and the dome opened out and glazed as in the central building; the dome over the mayor's parlour has been similarly treated. The two partitions which divided these three apartments have been removed, so that the large hall, the council chamber, and the mayor's parlour, now form, as they did in the original building,—one hall of large proportions, which will form one of the finest free library buildings in the kingdom. The shelving, which is now nearly completed, measures about a mile and a half. The alterations have been carried out by Messrs. Neill & Sons, under the superintendence of Messrs. Barker & Ellis, architects.

The Thirlmere Water Scheme.—In connexion with the proposal to supply water from Thirlmere, it may be mentioned that the projectors of the scheme assert that the Manchester Corporation are going for their water where there is an abundant supply, where there is scarcely any population, for there are only about 200 people in the watershed, where the land is mountainous and perfectly watertight, and where, except in the valleys, there is very little vegetation. The following are some of the particulars on which they rely:—Thirlmere is situated close to the district of Borrowdale, where there is the heaviest rainfall in England, and clouds from every direction except the south-east can pass through open valleys or gorges to the mountains which form its gathering-ground. For several years past the rainfall at Wythburn and Helvellyn (Birkside), both within the Thirlmere gathering-ground, has been registered, and the average is found to be about 104 in. Compared with the rainfall at Longdendale, that at Thirlmere is almost double, the average of the gauge at the former place from 1855 to 1876 being 49·77 in. The present drainage-ground of Thirlmere is 7,400 acres in extent, but this will be increased to nearly 11,000 by the impounding of the drainage-ground of St. John's Beck and Shoulthwaite. At present the area of the lake is 315 acres, but when raised 50 ft., as is contemplated, the top water area will be increased to nearly 800 acres. The height above the sea level will then be 583 ft. The sheet of water will thus be considerably more than doubled. The raising of the lake will be effected by blocking up the present outlet at the northern end, whence the water flows through St. John's Valley. This outlet is 24 ft. wide, and the embankment which will be necessary will be carried from the Great How to the bump of rock which stands in the centre of the northern end of the lake. Beyond this bump of rock the land forms a sufficient embankment for the present lake. It is, in fact, 12 ft. or 13 ft. above the level of the water, but when this is raised the depressed ridge beyond the bump of rock will have to be raised also, the rock dividing the two works. The top level of the outlet,—part of the embankment,—will be 116 yards in length. The other part will be 178 yards long, and over the top a road will give access to the western shore. In height the embankment will vary from 47 ft. to 61 ft. The corporation intend, in the first instance, to arrange for 10,000,000 gallons of water per day, syphon pipes, where necessary, being laid of that capacity. Where tunnelling has to be done, or aqueducts laid, the work will be done in such a manner that 50,000,000 gallons of water can eventually be passed through them per day. There will be no filtering of the water, which has been certified by several eminent analysts as equal, if not superior, to that of Loch Katrine, whence water is supplied to Glasgow. As to variation of the lake level, it will, it is said, be no greater than it is now,—namely, from 5 ft. to 6 ft. The longest drought in the lake district of which there is any record lasted about eighty days, and during such a drought the drawing off of 10,000,000 gallons per day, and paying compensation water, would only reduce the level of the lake 6 ft. in vertical depth. When 50,000,000 gallons per day are withdrawn the lake at the end of a drought of eighty days,—a very rare occurrence,—would be drawn down 25 ft. The cost of the first instalment of 10,000,000 gallons is estimated at 1,700,000*l*. It is estimated that every further 10,000,000 gallons will cost 400,000*l*. in laying down additional syphons. The Manchester Corporation have already made considerable purchases in the neighbourhood. The completion of the works, including the obtaining of the Act of Parliament, is estimated to occupy ten years.

PICTURES AT THE UNIVERSITY OF GLASGOW.

When recently in Scotland, after the Aberdeen Congress of the Social Science Association, Mr. E. M. Ward, R.A., unearthed a number of pictures at the University of Glasgow, to which they were bequeathed by Dr. Henderson, a very good scientific writer and connoisseur of art.

Here is a list of the principal works:—

1. Raffaelle's Madonna della Sedula (same size as original, and evidently either touched upon by Raffaelle or executed in his school,—very fine).
2. Oil miniature of Galileo (Florentine work, and evidently from nature).
3. Stothard, R.A. (allegorical group in his best style).
4. La Belle Ferronnière (good copy from original by L. da Vinci, in the Louvre).
5. Two views in Venice, by Guardi (in his best style).
6. Two views by Canaletti.
7. Albano (group of dancing boys,—very good).
8. Moonlight, by Vandernesi (very fine, but much damaged).
9. Both (fine landscape).
10. Annibal Caracci (head, life-size).
11. Metzu (good, but much damaged).
12. Mais (very fine).
13. Sir Charles Eastlake (view in Athens).
14. Carl du Jardin (landscape).
15. Barghem (ditto).

There are, in addition to these, some very creditable works, which need not be mentioned; and altogether the works form a collection which, should the University think fit to place it better, and with better light than it now enjoys, we feel sure will form the nucleus for an important gallery of pictures, to which there is little doubt the neighbouring gentry may be induced to contribute.

When first seen, they were in a filthy state and miserably placed; but Mr. Ward had them all down; washed them himself with soap and water, and obtained a promise from the principal, Dr. Milligan, that they should by no means be touched by any local "restorer."

They are, on the whole, in very fine condition considering the treatment and neglect they have hitherto undergone.

GLASGOW PUBLIC HALLS.

A description of the new Public Halls in Granville-street, Glasgow, appeared in these columns some time since; but in view of the fact that the building was inaugurated by a performance of the "Messiah" on the evening of the 13th ult., at which the Princess Louise and the Marquis of Lorne were present, it may not be out of place to revert to a few of its more leading features. The idea of erecting the new halls partly originated from the inconvenient position of the City Hall in Candleriggs, and the inadequate accommodation it afforded on the occasion of large gatherings. So far back as 1871 an influential company was formed, with the object of acquiring a large area of ground in the west end of the city, bounded by North-street, Kent-road, Granville-street, and Berkeley-street, and building thereon a commodious hall after the style of the Philharmonic Hall, Liverpool. The original sketch-design for the proposed building was prepared by the late Mr. John Cunningham, architect of the Liverpool Hall, Mr. Campbell Douglas, of Glasgow, being associated with him in the work. As the entire undertaking proposed was one of considerable magnitude, in 1872 it was decided to proceed with the erection of the western portion of the edifice alone, and the result is the hall just inaugurated, which is described as one of the most commodious in the kingdom. The length is 185 ft., the width 75 ft., and the height 58 ft., while, under ordinary circumstances, the hall will accommodate 4,000 persons. Even on the occasion of a concert, when the seats are necessarily placed more widely apart, and when space has to be reserved for the chorus and orchestra, no fewer than 2,300 persons can be comfortably seated, allowing room for 450 members of the chorus, and from seventy to eighty persons in the orchestra. As a reason for providing so much space for the performers, it should be explained that a frequent use to which the new hall will be applied will be for the holding of the Grand Orchestral Concerts which have now become an important institution in this city and neighbourhood. Although an ungracious task to refer to such a matter in connexion with an undertaking otherwise so successful, it must be stated that the unusual shape in which the orchestra is constructed is considered a defect in the arrangements, the large organ having been brought so prominently forward as to divide the orchestral space, and separate the members of the chorus. Some little alteration, however, in the front of the orchestra and adjacent balconies has been suggested, and it is possible that this may be carried out, and so far remedy the defect complained of. The organ itself, which is a magnificent instrument, of ornamental appearance, has been built by Messrs. T. C. Lewis & Co., of London, from the specification of Messrs. H. Smart and W. T. Best, and has sixty-four sounding stops and fourteen couplers. Messrs. Campbell Douglas & Sellars are architects of the new Hall. The following are the principal contractors:—Mr. James Watson, mason; Mr. George Gilroy, joiner; Mr. James Steel, plasterer; Messrs. Wallace & Connal, plumbers; Messrs. A. & D. Mackay, slaters; Messrs. Alexander & Howell and Messrs. M'Kenzie & Co., upholsterers; Messrs. Rait & Lindsay, engineers; Messrs. Combe & Son, heating engineers; and Mr. Andrew Wells, painter.

NEW CIRCUS FOR GLASGOW.

A commodious new building, intended for a circus, was inaugurated by Mr. James Newsome on the 12th ult., this being the second establishment of the kind in the city of Glasgow. The new erection, which is of brick, occupies a site in East Ingram-street, and its dimensions are 120 ft. in length, 110 ft. wide, and 57 ft. in height, accommodation being provided for 3,000 spectators. The various parts of the house are reached by separate entrances. The arrangements and decorations of the interior are of a tasteful description. The roof is supported by twelve main pillars, with an equal number of subsidiary ones in the rear. Each pillar is surmounted by a display of shields and flags, which has a very pretty effect. The chairs in the stalls on the west side of the house are of ebonised wood covered with crimson velvet, the boxes in the rear being hung with lace curtains, and embellished with mirrors. The second seats are on the side of the stalls, and these are covered with crimson cloth. On the east side of the ring are

the "pit" seats, while the gallery runs all round the house. The "ring" is 42 ft. in diameter, each of the two communicating doors being surmounted by a neat crimson canopy ornamented with a gilt horse. Light is supplied by a double row of jets extending the whole length of the building, and from a pendent crystal gaselier weighing half a ton, and having 210 lights arranged in six tiers. Dressing-room accommodation for the artistes has been provided on the north side of the building, while on the south side there is stabling for sixty horses; and with a view to provide good ventilation, while avoiding draughts, a line of ventilators has been placed along the roof for the egress of the heated air. Mr. McAndlis is the architect of the new building, Mr. Ponton the builder, and Messrs. Chas. Jenner & Co., of Edinburgh, are the upholsterers and decorators.

MESSRS. COCKERELL'S NEW BUILDINGS AT PURFLEET WHARF, BLACKFRIARS.

A PROMINENT block of new buildings is now in course of erection at Purfleet Wharf, near Blackfriars, for Messrs. Cockerell, coal merchants, a portion of which is intended as a coal depôt, and will contain extensive offices and a large range of stabling. The buildings and depôt will cover an area of about an acre in extent, having a frontage to Earl-street, near Thames-street, of 80 ft. in length, and extending to the north bank of the river, about 300 ft. in depth. The principal elevation of the building is nearly opposite the new premises of the *Times*' offices. In excavating for the foundations a depth of 25 ft. below the pavement line was reached. The footings of the foundation-walls are 6 ft. in thickness, and the lower portions of the walls themselves are 2 ft. thick. The elevation to Earl-street is 54 ft. in height, and is surmounted by three gables. The building contains three lofty stories above the ground-floor, which is carried up with grey granite piers, and a portion of this part of the structure will consist of shops. The three stories above the ground-floor are faced with red bricks, with Portland stone dressings and strings, the arched window-heads and reveals being in red moulded brick, and the sills in Portland piers. All the windows have iron sashes, all the upper floors being intended for warehouse purposes. At the east end of the elevation, there is a gateway 10 ft. in width, having an arched head in Portland stone, supported on Portland stone. A line of tramway will be laid along this passage, and will be carried the entire depth of the depôt to the margin of the river. Strong iron columns, resting on massive bases in concrete, are carried up from the basement to the top of the building, supporting the several floors. The whole of the east side of the ground-floor of the building, together with the basement, will be appropriated as offices for Messrs. Cockerell's business purposes, the floors of this part of the structure consisting of iron girders and concrete arches. On a spacious area of ground at the west side of the rear of the building, a separate block, containing the stables, will be erected.

The architect is Mr. Alfred Bovill, and the contractors are Messrs. Peto Brothers, Mr. Meade being foreman of the works.

NEW BUILDINGS IN FLEET-STREET.

AT the corner of Fleet-street and Salisbury-court a large block of old buildings standing on land belonging to the Vintners' Company has just been cleared away, and on the site a range of new buildings is in course of erection which, when completed, will form one of the most prominent features in Fleet-street. In designing the new structure the Queen Anne style of architecture, refined, has, to a considerable extent, been adopted as regards those portions of the Fleet-street and Salisbury-court elevations above the ground-floor. The Fleet-street frontage is 52 ft. in length, and the extreme height, to the apex of a central gable, 64 ft. The lower portion of the elevation, to a height of 26 ft., is carried up with polished Aberdeen granite piers, with capitals and lintels of the same material, the former being richly carved and ornamented, and surmounted by figure-heads in Dumfries stone. Immediately above is a cornice, also in Dumfries stone, projecting 14 in. beyond the main face of the elevation. This is again surmounted by a low ornamental iron balcony. This part of the structure will consist of the ground and mezzanine floor above, the former being 14 ft., and the latter 11 ft. in height, and is intended for spacious shops and show-rooms. The windows of the ground-floor, and the lower portion of the mezzanine floor above, will be of plate glass, whilst the glazing of the upper portion of the last-named floor will be in the small squares of glass of the Queen Anne period. The rest of the elevation is in red brick, with Dumfries stone windows and dressings. The floor above the mezzanine contains a range of five windows, including a prominent bay window in three divisions, in the centre. All the windows have pediment heads, sills, and reveals, in Dumfries stone, the glazing of the several windows being uniform with those of the mezzanine floor below,—the lower part of plate glass, and the upper part of the Queen Anne type. The third floor windows are square-headed, and all in red brick, the glazing of the whole being in small squares of glass. A frieze under the main cornice is carved with wreaths of flowers, fruit, and corn. In the centre of the main cornice, immediately above, is an arched pediment enclosing the arms of the Vintners' Company, and above the cornice is a balustrade in terra cotta, the whole being surmounted by a coping and central gable in Dumfries stone, with a curved roof containing circular dormers on each side of the central gable. At the angle of Fleet-street and Salisbury-court there is a similar elevation about 6 ft. in length, with a return uniform frontage along the west side of Salisbury-court, extending to a depth of 62 ft. southwards in the direction of Dorset-square. At the extreme end of the Salisbury-court frontage, there is a separate entrance to the upper portions of the premises. In addition to this block other buildings of similar design are about to be commenced, which will have a frontage to Salisbury-court, in continuation southwards, of 65 ft. in length, the entire Salisbury-court frontage of the two blocks being upwards of 130 ft. in length, and occupying almost the whole of the west side of that thoroughfare as far as Dorset-square.

Mr. A. Peebles, of Cannon-street, is the architect for the whole of the buildings, and the contractors are Messrs. Langmead & Way. Mr. J. H. Grant is clerk of the works. The cost of the buildings now in progress will be between 14,000*l.* and 15,000*l.*, and the estimated outlay for the whole when completed is upwards of 30,000*l.*

NEW PUBLIC OFFICES AND FREE LIBRARY AT HANDSWORTH.

AT Handsworth, in Staffordshire, new public offices are about to be erected in connexion with a free library, and the memorial stone of the buildings has been laid by the chairman of the Local Board. The style of architecture adopted is Gothic, of the Tudor type. The buildings will contain a board-room and offices for conducting the business of the local board, and will also include an engine-house and stables for the fire-brigade staff, together with cart and implement sheds. The offices and the apartment for the free library will be in the front part of the building, which will be surmounted by a lofty tower, under which will be the main entrance to the offices. A stone staircase immediately facing the entrance will lead to the first floor, which will contain the board-room, a large apartment 40 ft. by 24 ft. On the same floor there will likewise be several committee-rooms, together with the clerks' and the sub-clerks' offices, waiting-rooms, and other conveniences. A floor above will contain the keepers' apartments. The entrance to the free library portion of the building will be altogether distinct and separate from that leading to the offices, and on the ground-floor will be a lending library and a reference library, whilst above there will be a reading-room, 44 ft. by 36 ft., having an open timber ceiling. The materials of the structure will be red pressed brick, with Hollington stone dressings, the building being covered in with Staffordshire tiles of an improved make. In the tower provision will be made for an illuminated clock. The cost of the building will be 12,000*l.*

The Worcester Theatre Burnt Down.—The Theatre Royal, Worcester, was burnt down on the morning of the 24th ult. It was rebuilt in 1874, under the direction of Mr. C. J. Phipps, F.S.A., on the model of the Gaiety Theatre.

DOINGS AT SHEFFIELD.

Street Improvements.—On the 19th ult. the Corporation of Sheffield decided upon an extensive scheme of street improvement. They are promoting eight schemes, in addition to thirteen for which power has already been obtained. The schemes will involve the outlay of an immense sum of money, and in the case of one of them a loss of nearly 100,000*l.* This one scheme has been rendered necessary by the running of tram-cars in narrow and crowded streets.

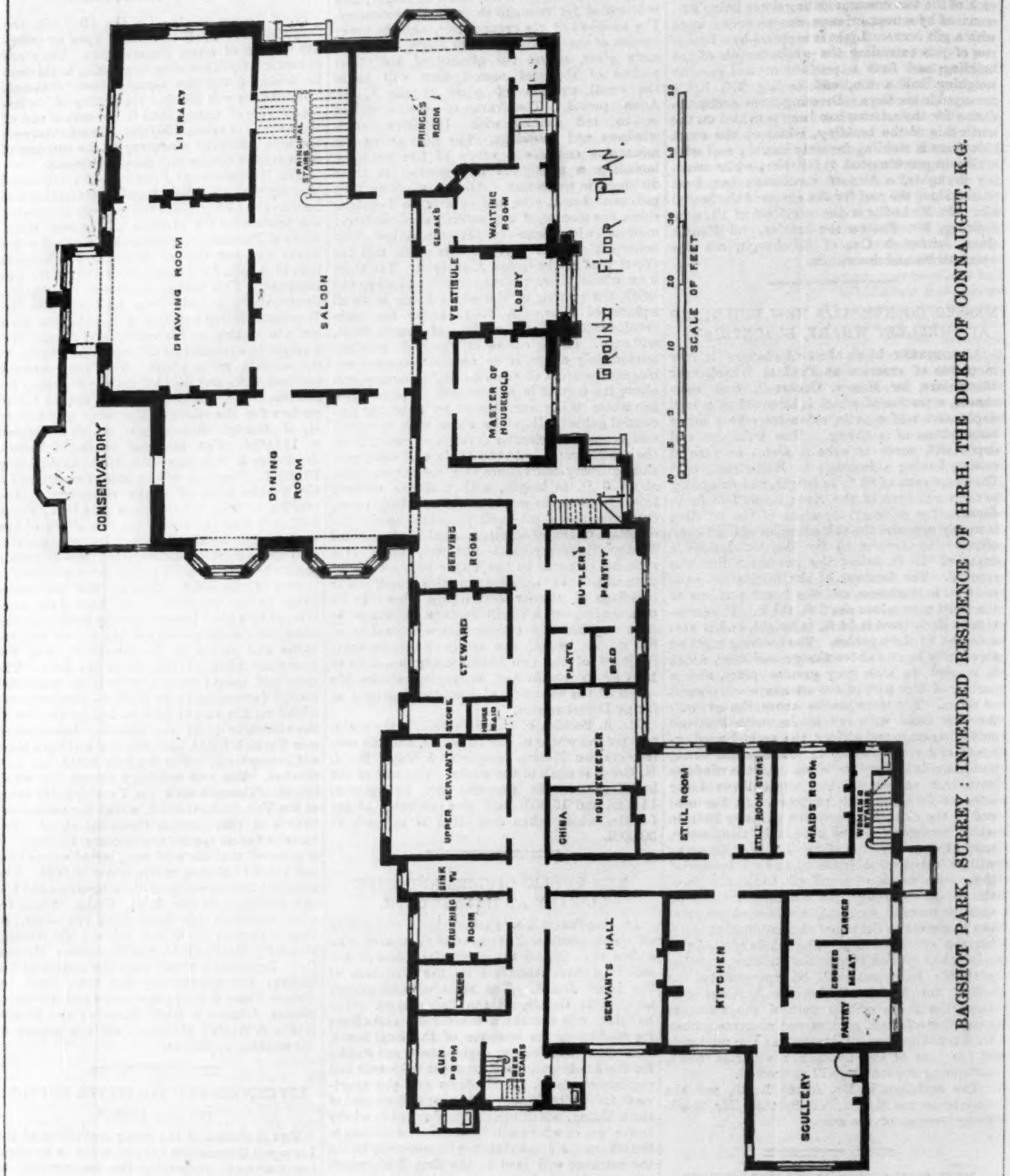
New Workhouse at Pitsmoor.—An adjourned meeting of the Sheffield Board of Guardians was held on the 15th ult., for the purpose of opening the tenders for the erection of the new workhouse at Pitsmoor. Tenders were received a few weeks ago, and that of Messrs. J. Tomlinson & Son, of Leeds, for the whole of the work, was accepted. This tender amounted to 124,136*l.* Subsequently a letter was received from Mr. Tomlinson intimating that a mistake had been made in making up his tender, and asking that it might be amended by adding about 10,000*l.* to the amount given above. This the guardians declined to do, and decided upon advertising for new tenders. The lowest of the second list of tenders for the whole of the work was that of Mr. J. Garlick, Birmingham, which amounted to 134,800*l.* The amended tender of Messrs. Tomlinson & Son was just 100*l.* more, being 134,900*l.* The total of the lowest contracts for the various kinds of works necessary in the erection of the building was 134,187*l.*, about 600*l.* less than the tender for the whole of the work sent in by Mr. Garlick. Under these circumstance it was resolved that Mr. Garlick's tender be accepted. Mr. Hall is the architect.

New Baths.—New Turkish and swimming baths on an extensive scale have just been erected by a local limited liability company, who some time since purchased the old swimming-baths and saloon in Victoria-street, and the triangular piece of ground at the back. The bath and saloon remain, very much improved though (according to the *Sheffield Independent*); whilst on the vacant ground and on the site of the volunteer depôt, the company have erected new Turkish baths, and are now making a large swimming-bath. The Turkish baths are now finished. The new buildings extend the whole length of Convent-walk, the Turkish baths being at the Victoria-street end, whilst the swimming-bath is at that nearest Cavendish-street. The exterior has no special architectural features. It is believed that the total cost, including the land and the old building, will be about 20,000*l.* The architect for the whole of the alterations and the new buildings is Mr. E. M. Gibbs. Those by whom the work has been done are:—Mr. B. Powell, mason; Mr. Sharp, joiner; Mr. Bissett, plumber; Mr. Hadfield, marble mason; Messrs. Davy Brothers (Limited) were the makers of the boilers; the upholstering has been done by Messrs. Jones & Sons; the chairs and tables by Messrs. Johnson & Sons, Fargate; and Messrs. Hydes & Wigfull (Limited) are the makers of the washing apparatus.

LIVERPOOL AND ITS WATER SUPPLY.

THE NEW SCHEME.

THE chairman of the water committee of the Liverpool Corporation has just made an interesting statement respecting the water-supply to that town, and the new project now under consideration for obtaining a further supply from Wales. Adverting to the income derived by the Corporation for the supply of water to the town, he made the remarkable statement that they were delivering at the present moment one-tenth less water, notwithstanding the increase of the population, than they were in 1871, and yet that their income was 30,000*l.* more than it was in 1871. This was owing to water which was previously wasted, but now saved, and the tenth of water now saved was adequate to the increasing demands of Liverpool for four years longer, which would bring in a further income of 20,000*l.* a year; in other words, the water previously wasted produced a saving in the revenue of 50,000*l.* a year. He next stated that in 1861 the calculation was that a further supply from new sources would be absolutely required, and whether the fresh supply was obtained from local or other sources, it was a matter of urgent necessity that they should look forward to a supply adequate to the future wants of the town. Referring to the new scheme for obtaining a supply from Wales, he said that the cost in



round numbers would be about a million, or a million and a quarter, and that the 50,000*l.* a year saved to the revenue by what was previously wasted would pay interest on the new scheme, and they should not ask the ratepayers for one farthing, as the water wasted and now saved was sufficient to pay the interest from the day the works were commenced, and virtually the effect of their operations would be that Liverpool would be presented with a scheme costing a million free of all charges.

Irish Ecclesiastical Monuments.—A notification has been issued by the Irish Church Commissioners, stating that arrangements are about to be made to protect and preserve ancient ecclesiastical monuments and relics in Ireland.

BAGSHOT PARK, SURREY.

A new mansion is in course of erection here for H.R.H. the Duke of Connaught, K.G.

The old house, once the residence of the Duke of Gloucester, stood in a low situation, and having become much dilapidated, has recently been pulled down.

The site selected for the new structure, of which we give a view and plan, is considerably more elevated, and commands an extensive and beautiful view. The house now building is in the Tudor style, which has been preferred to Lombardo-Gothic; the materials are red brick and Portland stone. The plan is formed so as to admit of future additions when required.

Mr. Ferrey, F.S.A., is the architect, and the contractor is Mr. Thomas Boyce, of Eagle Works, London.

ROYAL ALBERT HALL.

The Royal Albert Hall Choral Society commenced their seventh season on Thursday evening, November 22nd, with a performance of Verdi's "Requiem." It was a happy thought of the directors of these concerts to place this *quasi* novelty first on the list, not only because the "Requiem" was first heard in this country at the Royal Albert Hall, under the auspices of the Royal Albert Hall Choral Society, but also, and chiefly, because it requires for its adequate interpretation unusual qualifications on the part of soloists, orchestra, and chorus. As giving a taste, therefore, of the quality of this society, the selection of Verdi's "Requiem" as the opening work of the present season was, we repeat, a happy thought.

If, on the present occasion, the inspiring

BAGSHOT PARK, SURREY: INTENDED RESIDENCE OF H.R.H. THE DUKE OF CONNAUG

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HE DUKE OF CONNAUGHT, K.G.—Mr. Benjamin Ferrey, F.S.A., Architect.

presence of the composer of the work, and the phenomenal perfection of the original solo quartette were wanting, they were to a great extent atoned for by the improved *ensemble* of the orchestra and chorus. To compare Mdme. Lemmens-Sherrington, Mdlle. Redeker, Mr. Lloyd, and Mr. Thurley Beale with the quartette brought over by Signor Verdi would be manifestly unfair, were it even in good taste. These, with the exception of Mdlle. Redeker, are all native artistes; the others were the pick of all Europe. In justice, however, to the efforts of our English singers, it is hardly right to qualify the praise which is justly their due. Of Mdme. Lemmens-Sherrington and Mr. Lloyd it may fairly be said that their high reputation cannot fail to be enhanced by their excellent singing in this arduous work, nor must we omit a word of commendation to Mdlle. Redeker and Mr. Thurley Beale; but the palm of excellence must be awarded to the admirable singing of the chorus. From the lowest whisper to the most supreme effort of force, every gradation of tone was exhibited in perfect proportion, nor were there wanting indications of those higher intellectual qualities which, however common in, in a greater or less degree, individual singers, are rarely found in large choirs.

To the orchestra likewise great praise is due for the musician-like style in which, under the efficient leadership of Mr. Pollitzer, it overcame the difficulties which characterise the accompaniments to this work.

The organ, in the experienced hands of Dr. Stainer, contributed its full share to the general success. Mr. Barnby conducted with his usual care and intelligence, and more than his usual zeal.

The Society announce the performance of Professor Macfarren's new oratorio, "Joseph," for the first time in London, on Tuesday evening, December 11th.

THE CAMBERWELL WORKHOUSE COMPETITION.

SIR,—We are all of us proud of our glorious institutions; but it is difficult to believe that amongst these can be included the Camberwell Board of Guardians. I write *apropos* of the list of tenders for the above which appeared recently in your pages.

On a former occasion you were good enough to insert a letter from me on this subject (see *Builder*, March 3rd); and, as I am more than justified by the result, I venture again, in the interest of the profession at large, and of all concerned, to draw your attention to this, one of the most flagrant instances of injustice in competitions that I have ever met with, in the hope that your powerful aid may be enlisted in the matter. I may premise that I am only a looker-on.

In the autumn of last year the Board instituted a limited competition for the proposed building. The terms laid down as to the extent and character of the accommodation to be provided were very clear; and the estimate was to include all necessary fittings, &c.; everything, in fact, required. Two premiums were offered, one of 50*l*., the other of 25*l*.; both sets of drawings to become the property of the Board. As appeared from the *South London Observer* of January 20th, 1877, and from other local sources of information, two of the designs were premiated; one of which, by Mr. R. P. Whellock, seems to have been generally considered very much the better of the two; but the other, bearing the plausible motto "Veritas," though abounding, as was pointed out by members of the Board, in all sorts of defects, and not, it would seem, coming up to the standard of the Local Government Board, or even to the instructions issued to the competitors, was ultimately chosen, on the ground of economy, the estimated cost of it being only 26,000*l*., as compared with 49,000*l*. for the other design.

I consider that the Board were without excuse in making the selection before attempting to test the accuracy of the figures, however roughly. If the amazing difference did not challenge some slight examination, and if there were no other reason for hesitation, my letter, above referred to, which, from a professional point of view, roundly asserted the impossibility of executing the work for less than double the sum quoted, should alone have been sufficient to make them pause.

What is the result? The list of tenders which you have just published, shows that the mean between the highest and the accepted one is 56,787*l*.! and that the accepted one itself is 53,674*l*.! or more than double the misleading estimate of "Veritas."

Now, sir, considering the point on which the award was made, I do think it will be really too monstrous if the Board still adhere to the course they appear to have chosen. It will be shameful and un-English on their part; and not very nice on the part of "Veritas," who, one would think, if he had a delicate sense of honour, would feel he must retire or be guilty of something very much like robbing another. I would ask the individual members of the Board what they would think of such treatment applied to themselves.

To many a man a few such blows as the loss of so important a work, fairly earned, to which so much time, thought, and expense had been devoted, and for which the 25*l*. premium is no recompense (especially as it involves the loss of the drawings), would be altogether crushing.

Should the Board not endeavour to retrieve their character, it is to be hoped that the ratepayers will make their voice heard on the subject.

SURVEYOR.

SIR,—As a competitor for the above, I deem it my duty at this juncture to recapitulate certain facts in connexion with this competition which I consider should be more generally known, more especially as I feel myself to have suffered a grave injustice in the matter.

It will be remembered that there were several,—that is to say, six,—architects who competed, including myself, and that the awards were made in January last, the first premium being given to the authors of "Veritas," Messrs. W. Berriman & Son, who estimated the work at 26,000*l*., and the second premium to myself, the author of "The Poor you have always with you," my estimate being for 49,000*l*.

On hearing of the great discrepancy in the estimates, I memorialised the Board of Guardians and in respectful terms urged that it was impossible to carry out their requirements for the amount stated by "Veritas," and suggested, as a fair test, that the two designs should be submitted to the oversight of a respectable and disinterested surveyor, when it would be seen at once whose was the reliable sum. My memorial was unavailing, my opponent's low estimate of 26,000*l*. was approved, and it obtained the first place.

These facts were made public at the time in all the local and professional papers, in all which, more or less, the discussions of the Board were given *in extenso*, and which any one may peruse for himself; and I think that but few minds, uninfluenced by prejudice or caprice, would come to but one conclusion as to whose was the best and most suitable design.

Now, sir, what is the sequel? The design of my opponent, "Veritas," has been subjected to the crucial test of *quantities*. Nineteen respectable contractors have tendered for the work upon the basis of these quantities, and the result is made known to the public in your paper as follows, viz., the highest tender being 59,900*l*., the lowest, 53,000*l*. Now how do these figures compare with the approximate estimates of the authors of the two premiated designs? Thus mine: 49,000*l*., or well within 10 per cent. of the accepted tender, and "Veritas," 26,000*l*., or less than one-half of the lowest tender. In the face of these facts I ask whether or not I have what Englishmen love, or used to love, "fair play"? It is manifest that mine is a very near approximation to the actual tenders, and was based, as I can readily show, upon sound principles and precedents, and yet I have had to give place to an opponent whose estimate, as borne out by facts, proves to be illusory.

Up to this time I have refrained from making my case public; but when I know, as I do, that the designs of my colleagues and self were never publicly exhibited, as is usual in such cases, and when the "Veritas" design is selected in the face of discrepancies which, at that time, in the interests of justice, demanded inquiry and test; moreover, when I observe that a tender for 53,674*l*. has actually been accepted and the work likely to go on, I consider it is right that these facts should appear for the benefit of all concerned.

It is simply ruinous to any architect to compete in such contests. His efforts or skill (in this instance a labour of many weeks) are abortive; he cannot win,—and, without hope of redress, he must retire with the mournful satisfaction that he has contended lawfully, and lost the race for speaking "the truth."

I maintain, therefore, that under the circumstances I have won this competition.

I must not close this letter without a word of discrimination, viz., in offering to some of the gentlemen who compose the Board expressions of my gratitude for the support they gave me,—a person previously unknown to them,—and in which course they consistently continued to the end, supporting their convictions under much opposition. I take it that such conduct proves them worthy of the important posts they fill and of the confidence of their constituents, of whom I am one of ten years' standing.

ROBT. P. WHELLOCK,
Associate of the Institute of Architects.

SIR,—My reason for writing to you on the subject of the recent competition for a new workhouse in Camberwell is, on the one hand, that justice in architectural competitions is a matter which so vitally interests our profession at large that the circumstances connected with this particular competition ought to be generally known; and on the other, that unless there be some explanation which it is impossible to derive from anything at present accessible to the public, simple justice to a very meritorious competitor demands that the decision of the Board of Guardians, who adjudicated on the designs, should be reversed in favour of that to which they assigned the second place.

The discussions in the Board were published at some length in the *South London Observer* and other local papers in January, 1877, and it appeared that finally the selection lay between two designs, namely, that which was accepted and that of Mr. R. P. Whellock, to which a premium was adjudged as second.

With scarcely a dissentient voice, however, it was admitted that Mr. Whellock's design was best, both in appearance and in the excellence and fulness of the arrangements, but the estimate—carefully and conscientiously prepared—of 49,000*l*. stood in its way, and his opponent's, which was offered with an estimate of 26,000*l*., was, after a very sharp contest, preferred on that score, as was argued, and on that score only. The tenders for this design have just been published, the lowest being 53,000*l*., the accepted tender, 53,674*l*.!

Either, therefore, the estimate submitted in the competition was not half what it ought to have been, thereby violating the conditions requiring it to be *approximate*, or else the design itself was so imperfect that works valuing 100 per cent. of what was at first proposed had to be interpolated before it could meet the requirements of the Central Board.

In either of these cases,—whilst I may ask in passing how such an irregular and uneconomic procedure may strike the Camberwell ratepayers,—I think your readers will agree that justice to the profession demands that the design which fairly won the competition should be recognised as such, and adopted.

F. C. PENROSE.

THE NEW REGIME AT THE INSTITUTE.

SIR,—I went to Conduit-street last week to hear what Mr. White had to say about flats. He gave us a very good paper, but we were not allowed to discuss it for a fortnight. By that time those who are interested in the subject will probably have ceased to care about it, so that those who are not will be allowed to force on the next business, which is the reading of another paper to be discussed at another interval of a fortnight. This will, no doubt, facilitate tranquility; but there is something else I have to mention, with your leave.

The two front rows of seats are appropriated as reserved seats for the council. Now, as the benches in question provide accommodation for about forty persons, while the probable attendance of members of the council cannot very well be put at more than five or six, the consequence is that a sort of vacancy becomes a little too apparent. I for one have no objection to see the members of the council made as conspicuous as they please; and, indeed, if it is intended that they should occasionally recline at full length upon the front benches, I am prepared to console myself with the reflection that they are entitled to both honour and ease. But there are disadvantages in the arrangement nevertheless. Sir Gilbert Scott and Mr. Wyatt, I observe, have to take obscure places amongst the crowd in the rear, whilst Mr. —— sits sublime in the centre of a space of 10 ft. square. The lecturer of the

evening, with a particular friend or two, used to form a little cluster near the desk; now they must go where they can. Mr. Beresford Hope—forbid it, Heaven!—will have to take a back seat, possibly beside Dr. Schliemann or Mr. Gladstone, because sauce for one must be sauce for another, or there is an end of all discipline. Moreover, there are certain men whom long usage has habituated to a seat on one of the forbidden benches, and a sense of custom may make the change go hard with them. Another thing is, that the awkwardness of the situation seems to be felt by the members of council themselves; for the best of them seem to huddle away at one corner, as much out of sight as possible. Then I saw that two or three people, who ought to have known better, had disregarded the placards of reservation,—an offence against one's instinct of propriety which provokes the inquiry who those people are, and why they are not taken by the ear by the proper officer, and conducted to the back of the room.

To cut the matter short, is it not the custom amongst Englishmen to meet together as peers? Might it not be left to the good taste of a scientific society so to place themselves in their meeting-room as to give honour where honour is due without placards of reservation for front benches? One word more. Have we not got on very well for forty years without such invidious distinctions? AN OLD MEMBER.

SEWERAGE WORKS.

West Kent.—The West Kent Main Drainage works, which comprise a line of sewers extending from the parish of Beckenham to the river Thames at Long Reach, near Dartford, and embracing the parishes comprised in the Bromley Union, as well as a portion of the district of Lewisham, are progressing very favourably. It is also contemplated (says the *South-Eastern Gazette*) to carry the sewage from the district of Croydon, and a scheme is now under the consideration of the Local Government Board for forming a combined sewerage district by the Sevenoaks Rural and Urban Sanitary Authorities, the sewer to be commenced at Westerham, and carried through the Valley of the Darenth into the West Kent sewer at Dartford, and it is expected that both the Dartford Rural and Urban Sanitary Authorities will ultimately avail themselves of the sewers laid down through their respective districts, although for the present they take no active part in the works commenced and proposed. The works have lately been visited by representatives of the constituent authorities, accompanied by the engineers, Sir Joseph Bazalgette and Mr. A. Williams, and by Messrs. Neave & Sons, the contractors. In addition to the principal sewer from Beckenham, there is a branch sewer, which commences at Orpington, in the Cray Valley, and passes through St. Mary Cray, St. Paul's Cray, Foot's Cray, and North Cray, forming a junction with the main sewer at Bexley. The works were practically commenced about nine months since. The sewer already executed in tunnel is about 5,600 ft. in length, while about 10,000 ft. have been constructed in open cutting, all in the upper portion of the scheme. The Cray Valley branch has also been commenced, and a length of about 1,800 ft. has been constructed between Bourne Bridge and Bexley. The outfall works consist of an open reservoir 500 ft. long and 129 ft. wide, and 10 ft. deep, with discharge pipes into the river. The reservoir will be divided into three compartments longitudinally by means of two walls, while transversely it will be divided by three sets of screens for straining the sewage, and otherwise treating it before its discharge into the river. The bottom of this reservoir is being made of lias lime concrete 3 ft. thick, of which material the inner dividing walls will also be built up. The outside walls will be of Portland cement concrete, with puddle on the outside. All the walls will be 10 ft. 6 in. high above the floor of the reservoir. There will be three openings from the main sewer into the reservoir,—one for each compartment, and either or all of them may be used as may be necessary. The sewage, after treatment, will pass from the reservoir through a double line of pipes about 400 ft. long, 4 ft. in diameter, and extending 250 ft. into the river. Each of the three compartments of the reservoir will have an outlet pipe opening into the main line of discharging pipes; each outlet, as also each inlet, will have its own penstock for regulating the admission and outflow of the sewage. At the outlet works a length of about 2,500 ft. of sewer has been constructed. The works will, it is expected, be completed in about two years from the present time.

Droitwich.—The Droitwich Rural Sanitary Authority has adopted the plans prepared by Mr. Edward Pritchard, C.E., for the drainage of a portion of the parish of Claines, more particularly Barbourne and Rainbow Hill, and has sent them to the Local Government Board for approval. Mr. Pritchard proposes, in laying out his system of sewers, to adopt the principle laid down for the guidance of local authorities by the Local Government Board, in the suggestions made by Mr. Robert Rawlinson, C.B., viz., the right or straight line system, with manholes and ventilating shafts at each and every change of gradient or lateral deviation. He proposes to dispose of the sewage by irrigation and downward intermittent filtration, the estimated cost (exclusive of purchase of twelve acres of land) being 10,500*l.*

Walsall.—On the 14th ult., the Walsall Town Council met to consider (1) the best means of disposing of the sewage of the borough, (2) the Rivers Prevention Pollution Act, 1876, and the various clauses thereof applicable to the borough, and also the propriety of authorising the acquisition of land, and any other measures necessary for the disposal, purification, and utilisation of the sewage of the borough. Reports were presented by Mr. Lewis Angell and Mr. T. Hawksley. The report of the first-named gentleman advised the general adoption of the water-closet system, and stated that no town could expect a positive profit from sewage farming, but must regard the question from the sanitary point of view,—viz., the most economical purification of the sewage, and advocated the application of the sewage of the town to land. His estimate for works at Crankhall Farm, in the event of that site being chosen, was 12,800*l.*, exclusive of land and laying out same; and for pumping, including repairs, about 1,400*l.* annually. His estimate of cost of works at Barr Beacon (exclusive of cost of land, or laying out same, or compensation) was 25,000*l.*; and of pumping and repairs, 1,920*l.* annually. Mr. Hawksley, in his report, discusses first the feasibility of the projects for utilising the sewage on an irrigation farm; and, second, the feasibility of establishing a precipitating work. Under all the circumstances, but principally because of the non-adaptability of the soil for the required purpose, he felt compelled to recommend the Council to discard the idea of establishing a sewage farm in the Tame Valley. An area of 600 acres would be required, involving, with the cost of altering and improving the channel of the river, an outlay of 250,000*l.* The total expense of No. 2, or Crankhall Farm scheme, would not be less than 170,000*l.*, if the Corporation could secure the whole farm, which, in the face of the opposition by the West Bromwich authorities, was not likely. The soil of Barr Beacon, or No. 3 site, was the best for the facile purification of sewage he had ever met with, and 250 acres would be sufficient for the purpose, but the great cost (viz., 200,000*l.*) of this otherwise inviting project almost necessarily precluded its adoption. With respect to the second branch of the subject,—the feasibility of establishing precipitating works,—he stated that the question presented but the one difficulty, which was not insuperable, of utilising or otherwise getting rid of the deposited matter, which, notwithstanding some ignorant assertions to the contrary, did possess a real and available manurial value. For the treatment of the sewage by the precipitating process,—which he claimed to be simple, effectual, and economical,—he recommended the purchase of from twenty to thirty acres of land in the Tame Valley, near to the remotest extremity of the Walsall district, and he estimated the cost at 40,000*l.* for works and land, and the working expenses at 1,500*l.* per annum, which amount, capitalised at twenty-five years' purchase, would represent a comparative outlay of 37,500*l.* Hence the total cost might be taken to be 77,500*l.*, or about 3,000*l.* per annum, or 1*s.* per head of the population. The Sewage Committee presented a report recommending the Council to accept and act upon Mr. Hawksley's view, and it was resolved to authorise the acquisition of forty-seven acres of land at Beecot.

Weymouth.—Mr. Hawksley has reported to the Weymouth Town Council as to the Park Drainage. He recommends deep subsoil draining, pumping by two eight or ten-horse power engines, and the construction of an underground tank to hold 20,000 cubic feet of water. The engines, Mr. Hawksley states, would be disproportionately heavy, but nothing less would be effectual. The report was referred to a committee.

FLITCROFT'S MONUMENT.

SIR,—My attention having been directed to the paragraph in your paper relating to the condition of the above in Teddington Churchyard, I have now made an inspection of it, and find there is a "Ledger" stone in good condition, and in a safe corner on the north side of the West Tower, out of the way of all traffic and wear, and the inscription on which is perfectly clear, and which I have copied for the information of those of your readers who may be ignorant of the qualifications and position of the deceased.

On the west wall of the church, over this, is a white marble tablet some 2 ft. 6 in. square, superposed by the semblance of an urn, also in white marble, the section of which is the half of a very flat ellipse. It is about 1 ft. high, with a projection of 1½ in.; this has been made in four or five pieces, each one dowelled into the backing of black or grey marble. The wet has loosened the urn, and the neck (a piece of marble some 1½ in. square) has gone.

There is an inscription in Latin on the tablet partially illegible from weather-stains only. A few shillings would "restore" this.

Shall be glad, of course to assist "Old Boy."

THE ARCHITECT TO THE RENOVATION.

COPY OF INSCRIPTION.

"Here lieth the Body of Henry Flitcroft, of Whitehall, in the County of Middlesex, Esqre., who had the honour of having ye three first Princes of the House of Brunswick with him in the Board of Works, of which he was successively appointed Clerk, Master-mason, and Controller, in the last of which offices he continued till his death, which happened on 23 Feby., 1769.

Also the remains of Henry Flitcroft, the only child of the above-named Henry Flitcroft, late of Richmond, Esqre., who died without issue April 3rd, 1826, in the 84th year of his age; and of Jane, his wife, who died May 12th, 1779, aged 25 years."

"DESIGN IN THE OBELISK?"

SIR,—Since the question respecting the purpose of the inequality in the measurements of the sides of the obelisk has been opened, I have experimented with four-sided truncated shafts, bringing these against dark buildings below, and against the bright sky above, without discovering any distortion in their outlines which would need correction, much less such an amount of correction as that of 8 in. in the Lateran and of 5½ in. the Cleopatra obelisk. In fact, the magnitude of the difference is to my mind conclusive evidence against the diffraction hypothesis.

Again, if the inequality in the widths of the facets were intended to counteract the effect of diffraction, the inequality should be greater in the upper part of the obelisk, where it would be in extreme contrast with the sky, than in the lower. The minimum correction would, therefore, be required at the base; whereas, by the favour of Mr. Erasmus Wilson, I am enabled to show that the minimum difference is at the apex, not only absolutely, but proportionally. The measurements of the sides, at the truncation, are respectively 4 ft. 10 in. and 5 ft. 1 in. The total absolute difference, of the inequality of the sides at the base, as compared with that at the truncation, is, therefore, as 5½ in. : 3 in., and the proportional difference is roughly as $\frac{1}{17}$: $\frac{1}{30}$. This is also, I think, conclusive against the diffraction hypothesis.

Of course, I am fully aware that the lines of an obelisk standing between the observer and a brilliant point of light would be distorted by diffraction, and that an obelisk might appear to be severed into two parts if that brilliant source of light were the sun. But that is a phenomenon which no change of dimensions would avert. This concentration of the luminous source is necessary to produce any marked effect by diffraction; for when luminous surfaces illumine objects, the waves issuing from different points, either of clouds or of the empyrean, obscure and neutralise each other. But, admitting for a moment the diffraction hypothesis, I utterly fail to perceive how the appearance of squareness in the obelisk could be preserved by an increased breadth being given to the sides in immediate contrast with the light; for, in viewing the obelisk so contrasted, the other two sides would not be in view, and in an angular, perspective view, the eye has little power of correctly estimating the absolute dimensions of foreshortened surfaces.

Dr. Birch notices a persistent irregularity n

the measurements of Egyptian structures. Did the Egyptians adopt this irregularity on principle? The following facts indicate a very imperfect knowledge both of art and of science, and tend to shake our faith in there being any subtle reason for the inequality which is the subject of discussion. There is a winged genius of considerable size depicted on the interior surface of the sarcophagus of the father of the Pharaohs, which has been endowed by the Egyptian artist with either two right or two left feet, instead of a right and a left foot. The artist may possibly have had some subtle reason for so endowing this figure, but we will not stop to discover it. I fancy, too, that I have seen Egyptian diagrams—I will not call them paintings,—in which the life-guards of Thebes are represented with both their legs on the same side of their war-horses. Did the Egyptian art critics insist that nothing should be left to the imagination? And we may form some idea of the obviousness of the Egyptians to the science of perspective from the fact that a front view of the eye is constantly present in profile views of the face.

With respect to the effacement of prior records as a possible explanation of inequality in the sides of obelisks, a correspondent of the *Times* states that Pharaoh Thothmes III. was infamed for his endeavours to erase, wherever he could, the name of his distinguished sister, Queen Hatason or Hatasops, who so long ruled Egypt as Queen Regnant in her own right, and whose beautiful obelisk, which still stands amid the ruins of Thebes, bears the significant and suggestive title of "Pharaoh's Daughter." But I find that Mr. Erasmus Wilson leans to the opinion that the inequality of the sides is due to the necessities of quarrying or of cleavage.

W. C. T.

As to the idea of Mr. Phené Spiers that the Obelisk is thicker one way than another because one way it is against the sky and the other seen against a building, I should be glad to know for what kind of sight it was so arranged,—for a long-sighted man or for one like myself short-sighted? I often, in looking at a very slender spire, see the finial or cross at top and then no stonework at all for a little distance, and I can fancy that if the stonework below the necking had been made thicker to suit me, it would have appeared clumsy to the eye of the architect who designed it. I always like to indulge in a stumpy spire; probably it is my sight which makes me prefer it, and this, perhaps, leads to another question. Are all architects who design stumpy spires short-sighted, and those who put up slender ones long-sighted? I am afraid Mr. Phené Spiers's idea, although clever, will not be believed in by many. I prefer Mr. Cave Thomas's notion that the obelisk is greater one way than the other owing to the accidental inequalities of quarrying.

G. T.

Bloomsbury.

BANE AND ANTIDOTE.

Mr. Arthur Angell, the Hampshire county analyst, recently read a paper at the Hartley Institution, Southampton, before the members of the local Literary and Philosophical Society, on a certain brown colouration, which, if not peculiar to Southampton Water and the rivers flowing into it, is still rare. He said that this year the peculiar colour, sometimes resembling muddy coffee, and at others something between that and red iron rust, appeared in the early part of the month of June and continued until late in October, when the nights became frosty. This brownness colours the whole of the water down to Netley Hospital, its effects being more marked in some places than at others, it being found at high water most concentrated at or near the shores, the deep water being comparatively free, but sometimes hanging about in clouds at particular spots, between which comparatively clear water may be seen. At dead low water a bottleful may be taken out clear and bright, arising from the freshets on the surface, whilst every stroke of the oar will bring up in eddies clouds of brown colour. At the verge of the green ocean water, this colour is mapped out with a striking sharpness. It never appears to reach Calshot, as before the ebb tide reaches the Spit it is stopped by the flood tide, which appears to carry it back to Hythe or thereabouts. A sample of the coloured water being dipped and held to the light appears of a pale reddish-brown tint, which the naked eye will show is due to the presence of countless myriads of fine brown points, as if some minutely divided brown dust or iron rust was suspended in the fluid. The whole of this colour, on the bottle being allowed to stand, will fall to the bottom, leaving the upper stratum of water quite clear, but if the bottle be turned bottom uppermost the stuff will fall in a flocculent mass, and is not again evenly distributed unless briskly shaken; whilst if a small quantity of the subsided matter be taken up in a dipping tube, it will be found difficult to let a part flow from the tube without letting the whole out together: this is because these little brown things surround themselves with a gelatinous medium. Exposed in a glass of sea water to the direct rays of the sun they show symptoms of increased vivacity with a bold eager front towards the light, and bubbles of gas are evolved which are believed to be none other than oxygen. A drop of this water shown under a 1-in. objective contains hundreds of specimens of semi-transparent brown-coloured bodies, filled apparently with highly refractive granular matter, these creatures being of a peculiar shape and very active in their movements, each furnished with a belt of cilia round its waist, and a long, transparent and exceedingly flexible tail. After death they give off an odour similar to that of seaweed, and change their colour to green,—thought to be indicative of the presence of chlorophyl. All these facts led Mr. Angell to the conclusion that these creatures are of vegetable origin, and in his further investigations,—which he described,—he found they figured in the Microscopical Dictionary as one of a species of *Peridinium fuscum*—an animal organism; but taking his own observations, apart from anything gained from books upon the subject, he was strongly of opinion that they were microscopic plants, performing the functions of living vegetables existing upon the products of the decomposition of dead organic matter and hastening its perfect oxidisation and final destruction. Man vitiates the river by pouring into it filth enough to render the water, especially in hot weather, a stinking abomination, but Nature sends this vast army to fight the enemy, and the water is kept sweet. When sewage no longer flows into the river the *Peridinium fuscum*, no longer needed, will speedily disappear, leaving the water a pure and translucent green.

ARCHÆOLOGICAL SOCIETIES.

Chester.—At the inaugural meeting for the winter session of the Chester Archæological Society, Mr. Worsley, F.S.A., of Winwick, read an interesting paper on "The Monumental Brasses of Lancashire and Cheshire."

Cambridge.—At a meeting of the Cambridge Antiquarian Society on the 12th ult., Professor C. C. Babington, president, in the chair, a paper by Mr. Jukes-Browne, F.G.S., was read, in which he gave a detailed account of "Flint Implements found at Helwan, near Cairo," and described geologically the nature of the site in which they were found. Mr. Naylor gave an account of some interesting frescoes which have been recently discovered during the restoration of Chesterton Church. Mr. Spencer G. Perceval, M.A., presented a black Romano-British vase (6½ in. high by 1 ft. 10 in. in circumference), which had been found by coprolite-diggers on Coldham-common, about 1860.

THE CROWN FLOOR-CRAMP.

Under this title Messrs. F. W. Reynolds & Co., of Southwark-street, have brought out a new flooring-cramp, which is worthy of notice. The driving-handle of this is mounted over the top of the cramp, and in a vertical position, so that it is always free to be worked by the workman, instead of being placed in a horizontal position at the side of the cramp, as in the ordinary way, which often necessitates the digging of a hole before the man can turn the driving-handle when laying down a ground-floor. The improved position of the handle enables the cramp to be worked with more ease and effect, the grip being greater. The screw works under a covered way, which protects it from clogging by dust, lime, &c.; but the most important feature in the new cramp is the mode of fastening it to the joist previous to its employment for closing up the boards. In the ordinary way, when being adjusted in the slot of side bracket to suit the various thicknesses of joists, the security of the position of the stud in the slot depends upon the tightness of the nut, which frequently slips out of position, and necessitates a blow with the hammer to secure the necessary tightness. Messrs. Reynolds employ a fixed rack, into which corresponding teeth on the washer under the ordinary stud belonging to the lever can pass. Upon this toothed washer being worked into the fixed rack no slipping can take place, and the wing nut only requires to be slightly tightened by the fingers.

ROAD MAKING.

LIVERPOOL ENGINEERING SOCIETY.

On the 7th ult. a paper was read by Mr. John Brodie, entitled "The Application of Blast-Furnace Slag to the Purpose of Road-making." He first pointed out that soft stone does not form a good foundation for metalling, as it works through and comes to the top, and quoted from the Parliamentary evidence of Macadam in support of his views. After saying that a road-surface should be elliptical in form, having a rise of 6 in. for a width of 20 ft. between curbs, he described the method of making slag-roads somewhat as follows:—On the earthwork surface the slag is laid, after being carefully selected and prepared, in blocks not less than 7 in. deep and 4 in. wide; these are well keyed together by means of small pieces of slag being driven between them, and the whole is covered over with broken slag and coke-ashes to the depth of about 4 in. The slag obtained from smelting the well-known Cleveland ore into "grey" or "foundry iron" he thought about the best for road-making, and the longer the slag is exposed to the atmosphere before being employed for this purpose the better, as it is rendered less brittle by this treatment.

SIR PAUL PINDAR'S HOUSE, BISHOPSGATE.

HOWE *v.* CROXTON AND OTHERS.

This was an action brought in the Chancery Division of the High Court of Justice by the owner of the Sir Paul Pindar Tavern, 169, Bishopsgate-street, to restrain the Metropolitan Free Hospital and their contractors from pulling down the adjacent house in such a way as to damage or endanger the stability of No. 169.

The two houses were stated to be to some extent framed together, so that parts of the rooms of one would be immediately above or beneath rooms of the other, the two having probably formed originally one house. The buildings are old and interesting, and the plaintiff deposed that he attributed much of the value of the goodwill of his business to the "antique and quaint appearance" of his house, which had been the mansion of Sir Paul Pinder, who lived in the reign of James I. It appeared that No. 169 was only separated from No. 170 by a timber-framed partition resting upon a beam, and that in the course of the dismantling and demolition of the adjoining houses, which had already commenced, a portion of the timbers supporting that partition had been removed to enable the authorities of the South Kensington Museum to get some large and handsome ceilings. Under these circumstances, the plaintiff showed that the pulling down of No. 170, even with every precaution, would endanger his house, and might lead to a settling down of its foundations, and on the 2nd inst. he obtained an *ex parte* injunction.

Mr. W. Pearson now moved for an injunction upon notice, on the ground that the plaintiff had a right or easement of support from the defendants' premises.

Mr. Cracknell, for the defendants, merely asked that the order should be without prejudice to any proceedings by them under the Metropolitan Buildings Act, and with special liberty to apply.

The order was taken in that form, and the motion being by consent treated as motion for judgment, to be subsequently set down *pro formâ*, the order was directed to be post-dated and entered as judgment for the plaintiff for a perpetual injunction accordingly, with costs.

LOCAL GOVERNMENT BOARD INQUIRIES.

Southampton.—On the 16th ult. Mr. Robert Morgan, one of the Local Government Board Inspectors, held an official inquiry at the Town-hall, Southampton, into the subject matter of an application made by the Town Council to the Board for sanction to borrow 87,000*l.* for paving, sewering, lighting, and otherwise improving certain streets, for works of water supply, for providing baths, slaughter-houses, fire-escape stations, and a hospital, and for re-paying certain moneys borrowed on security of old Water Works and Improvement Commissioners' Bonds.

Mountsorrel.—On the 14th ult. Mr. J. Thornhill Harrison, C.E., one of the inspectors of the Local Government Board, held an inquiry at Mountsorrel, Leicestershire, relative to an application made by the Barrow-on-Soar Rural Sanitary Authority for sanction to borrow 2,000*l.* for works of drainage, according to plans prepared by Mr. Hodson, C.E., of Loughborough. The sewage is to be disposed of by means of irrigation.

THE TROJAN TREASURES.

Dr. Henry Schliemann, some little time ago, promised his London friends that they should see at any rate a selection of the remarkable relics which he had unearthed at Hissarlik, and he has kept his word. He has brought to England, with cost and labour, more than 4,000 objects, and is now busily engaged in arranging them in the South Court at the South Kensington Museum, where, in the course of a few weeks, they will be publicly exhibited. The bulk of the collection is of terra-cotta, with numerous varieties of the owl-faced tutelary goddess of Ilium, but it also includes much of the Treasure of the supposed King Priam, of the mythical heroic age, and the brilliant sculptured block of triglyphs, with Phœbus Apollo and the four horses of the sun in the metope. London will owe thanks to Dr. Schliemann.

THE REBUILDING OF DRUMMOND'S BANK, AND THE GOVERNMENT.

It is now nearly twelve months since the substantial scaffolding and hoarding was erected in front of Messrs. Drummond's bank, Charing-cross, for the purpose of taking down the old building, and erecting a new structure upon the site, and yet up to the present moment not a step has been taken towards the demolition of the building and the erection of the new premises, although it is generally understood that designs for a new and handsome architectural structure have for some time past been prepared by Messrs. Waller, of Lisle-place, which those gentlemen are prepared at once to carry out. It is stated that the cause of the delay is owing to a difficulty in an arrangement being entered into with the Government for the purchase of the site for public buildings, which it is understood the Admiralty are desirous of erecting upon it. The site has been occupied as Messrs. Drummond's banking-house for more than two hundred years, and apart from its intrinsic worth, Messrs. Drummonds are understood to have placed an enormous value upon it for the purposes of their business. As the Parliamentary notice which has just been issued by the Office of Works, with reference to new public buildings in the neighbourhood does not include this particular property, it would appear that the Government have no intention of acquiring it by compulsory purchase. Meanwhile, the residents in the immediate locality are beginning to complain of the inconvenience caused to pedestrian traffic by the footpath having been so long absorbed without the erection of the new banking premises being proceeded with, and it is stated that a representation will shortly be made to the authorities on the subject. Within the last few days 2 ft. have been taken from the carriage road, in order to widen the temporary footpath in front of the hoarding.

THE LEICESTERSHIRE CLUB-HOUSE, LEICESTER.

This building was opened on the 14th ult. It faces Welford-place and Pocklington's-walk, having a frontage to the former of 62 ft., and the latter of 30 ft. The style of architecture is Flemish, and the height of the building to the ridge is 58 ft., to the parapet 46 ft. The edifice is built of red brick, with Ancaster stone dressings. On the basement are ten rooms, including the kitchen, which is 27 ft. by 20 ft., and the cooking-apparatus has been supplied by Messrs. March & Pattison, St. Peter's Foundry, Leicester. The arrangements for heating the premises were undertaken by Mr. Constantine, of Manchester. There is a cool cellar for the storage of beer, and a very convenient one for wines. A steward's room, which faces the latter, is nearly 15 ft. by 15 ft., and the servery on the same floor is 16 ft. by 14 ft. The front entrance is approached from Welford-place, and, after ascending eight stone steps, the entrance-hall is gained, the openings being through oak folding-doors, in the panels of which are stained-glass windows by Mr. Swain Bourne, of Birmingham, who has also provided the rest of the stained glass. The hall is paved with black and white tiles, the design being after the Roman style. It is the first time that these tiles have been laid in Leicester. The same floorings have been laid in other portions of the building. They have been supplied by Mr. Eratt, of Coalville. The hall is 26 ft. by 20 ft.; the conversation-room, 16 ft. by 14 ft.; the reading-room, 46 ft. by 25 ft., and its height 15 ft.; the dining-room is 40 ft. by 25 ft.

The communication to the various parts of the building is by means of electric bells, by Mr. Webb, of High-street, Leicester. The ventilation is on Tobin's principle. The furniture has been supplied by Messrs. Spencer & Sons, of Leicester. There is a sprinkling of carving over the building, by Mr. Harry Hems, of Exeter.

The architects are Messrs. Goddard & Paget, of Leicester; the clerk of the works is Mr. W. Clifton; whilst the builder is Mr. T. H. Herbert, of Leicester, whose contract was for 8,400*l.*, but the probable cost of the club altogether, inclusive of its fittings, will amount to nearly 12,000*l.*

The building was commenced on the 1st of October last year, and has taken little over twelve months to erect.

A NEW VESTRY HALL FOR HOLBORN.

The Holborn Vestry have decided upon the erection of a new vestry-hall, taking advantage of the ground which has been cleared in the neighbourhood of Gray's Inn-road for the new street eastward from Oxford-street. At the meeting of the Vestry last week the Works Committee recommended that the site at the corner of Gray's Inn-road and Liquorpond-street, immediately adjoining the point where the new street will intersect Gray's Inn-road, should be purchased for erecting the proposed building thereon. Mr. Hunt, in moving that the recommendation be adopted, observed that it was high time such a district possessed a vestry-hall worthy of the locality. A building of the kind was much wanted in the parish, and in addition to its usefulness for public business it might be made a source of profit, as he had no doubt it would be readily taken for meetings, lectures, and other entertainments. In proof of this he instanced the Shoreditch and other vestry-halls, which were very remunerative in this respect. He suggested the erection of a spacious and handsome building, and remarked that if they went to an expense of 25,000*l.* it would be well laid out, and produce a good return. The chairman, in supporting the recommendation, said there was not a parish or district in the metropolis of any importance that had not a hall suitable to the wants of the locality, and Holborn lost prestige by not having one. He would undertake to say that the Metropolitan Board would gladly advance the sum required for the erection of the building. The recommendation was unanimously adopted.

SCHOOLS OF ART.

Winchester.—The annual distribution of prizes to the students of this school was held a few days since, the mayor (Mr. T. Stopher) presiding. The report showed the school to have 118 students, and went on to say that,—

"Owing to various causes,—in part, perhaps, to delay and loss of time in arranging and preparing the new room,—there has been some falling off in the general prosperity of the school. At the same time there is every reason to hope that, with the encouragement given to the work in the mass, the greater freedom allowed to the special taste and capability of individual students by the present director of the Art Division at South Kensington, E. J. Poynter, R.A., and the impulse given to public education in elementary schools, the advantages offered by the School of Art will attract an increasing number of students of various classes and ages."

The financial position of the schools is satisfactory.

Reading.—At the distribution of prizes to the Reading School of Science and Art students, on the 13th ult., Mr. Walter, M.P., said the object of the Department of Science and Art in establishing such schools was to train up the rising generation to take commanding positions in their various trades, and to infuse an artistic spirit into the mechanical classes. The decline of art was due to the invention of machinery. In the best days of art in Germany and Italy, the artist was a mechanic, and executed his own designs. Nowadays, no doubt owing to the introduction of machinery, the artistic idea seemed to have been lost sight of, and the mere mechanical idea survived. It was probably necessary to the mass of mankind to have things cheap, and they did not care to pay a high price for the good article; but if they wanted better things they must raise the character of work in manufactories. He did not see how that was to be done except by cultivating better taste among mechanics. He cited, in illustration of his remarks, the case of chairs and spoons, in the production of which the present generation was greatly excelled by the workman of a hundred years ago. A pure taste was a thing of almost national importance, because the character of a nation depended in a certain measure upon the way in which the taste of its people was cultivated. It was quite a mistake to suppose that the taste was merely an arbitrary or capricious thing. There was such a thing as a pure taste and a vicious taste, in illustration of which he referred to the new opera-house in Paris, which he saw the other day. It was one of the most costly and lavish buildings in the world; but he never saw a building in his life the interior of which struck him as more vicious and meretricious in ornament and more extravagant in grandeur. That was the opinon of most cultivated Frenchmen. Within 200 yards or 300 yards of that monument of bad taste was one of the most beautiful buildings in the world, the Italian Opera. The only explanation that could be given of that fact was that there had been a falling away in the national taste. Coming nearer home, they could not look round on the architecture of the present day, either in domestic, ecclesiastical, or public buildings, without seeing a great deal to disapprove of, for a great amount of exaggeration prevailed in decoration. The new National Gallery and Keble College, Oxford, were illustrations of his remarks. People seemed to think they could not lay on colour enough, nor cover the space allotted to them too completely with designs, ornaments, and patterns of every kind, so that there was no rest for the eye. Believing that that was wrong, he looked to schools of science and art to be the means of producing a more refined and cultivated taste in those important matters.

Kidderminster.—It is proposed to erect a new building for the Kidderminster School of Art, from plans prepared by Mr. T. M. Gething, architect. Dr. D. W. Goodwin, the late mayor, has given the site.

Gosport.—The Right Hon. Sclater-Booth, on the 19th ult., presented the prizes gained by the Gosport branch of the Portsmouth, Isle of Wight, and Gosport School of Science and Art. The right hon. gentleman spoke at some length on the importance of extending the knowledge of art, and traced its recent history and development in this country. The importance of it was fully recognised by the late Prince Consort, who was the mainspring of the Exhibition which took place in London in 1851, and the results throughout the country had been satisfactory, and justified the policy which had been pursued by the Government in reference to the schools of art. In 1876 the amount of money paid for results was about a quarter of a million.

WATER SUPPLY.

Wigan.—The Wigan Town Council have requested the Mayor, Chairman of Water Committee, and Town Clerk to see the Town Clerk of Manchester with a view to the acquiring by the Manchester Corporation of powers whereby the town of Wigan could be supplied with water by the scheme which proposes to make use of Thirlmere for water supply for Manchester and district. The storing capacity at Wigan waterworks has been found not to be sufficiently large for the supply of the town, in consequence of the great increase in the number of houses in the borough, and a larger supply will have to be provided during the next few years.

Oldham.—The proposal made by the Manchester Corporation to acquire Thirlmere as a source of water supply has attracted attention in Oldham, and some correspondence has passed between the town clerk (Mr. H. Booth) and Mr. Bateman, engineer. In a letter from the town clerk to Mr. Bateman, Mr. Booth said he was directed to ask if he thought there would be any chance of the Oldham Corporation obtaining any direct or indirect benefit from the proposed scheme, in case they were willing to assist the Manchester Corporation to get their Bill through Parliament. The Oldham Corporation Waterworks Committee would respectfully give expression to their opinion that it might be to the interest and advantage of the city of Manchester, and of the whole of the towns and places of which that city was the centre, if they were to combine in some form or other, so far as regarded their water supply. The committee thought that, if possible, one grand comprehensive scheme, or rather series of schemes, should be developed for the whole of the Manchester dis-

trict, at the joint expense of the several places interested. The committee suggested that it would be worth the while of the Manchester Waterworks Committee to have a conference on the subject with the waterworks committees of the various towns forming the Manchester district. If there could be a combined action on the part of the district, or of a considerable portion of it, the efforts of the opponents of the Thirlmere scheme would have very little chance indeed of success. In his reply to Mr. Booth, Mr. Bateman said he believed it was not the intention of the Manchester Corporation to apply for an extension of their limits of supply in the next session of Parliament, but if they obtained their Act they would certainly be in a position to help their neighbours. He thought Mr. Booth's arguments used in favour of participation were strong.

South London.—Notice is given of the intention to promote a Bill in the next session of Parliament for the incorporation of a company having for its object the supplying of water, from springs at Tooting, to Wimbledon, Merton, Richmond, Streatham, Tooting or Tooting Graveney, Upper Tooting otherwise Tooting Beck, Wandsworth, Mitcham, Beddington, Wallington, Lambeth, Croydon, St. Giles Camberwell, Battersea, Norwood, Anerley, Sydenham, Forest Hill, Dulwich, Penge, Stockwell, Peckham, Clapham, Brixton, Balham, Putney, Roehampton, Kingston-on-Thames, Thames Ditton, Esher, Long Ditton, Malden, and Morden, in the county of Surrey; and St. Nicholas and St. Paul, Deptford; Lewisham, Beckenham, Anerley, Sydenham, Forest Hill, and Penge, in the county of Kent. Power is reserved for the sale or lease of the undertaking to, or its amalgamation with, existing companies supplying the district.

SANITARY MATTERS.

Twyford.—Dr. Gordon Stables, R.N., writes to the *Reading Mercury* as follows:—

"I believe it is a good thing for us here in Twyford that the balmy breath of the Berkshire woods circulates so freely around us, or no doubt typhoid would soon find us out and decimate us. The cesspools are in a fearful condition, and badly looked after. Clear moonlight nights, with no wind, are chosen on which to empty them. These nights are nights of terror to many inhabitants, and vomiting is the general thing. In summer the air is tainted by the pestilential odours from the butchers' back premises; by night in winter people can hardly stop in a room for any time for the bad odour of the gas. When I took the house in which I live I was assured that the water was very good. That water poisoned my whole family—including the dogs. It is closely surrounded by three or four fearful cesspools, that had not been cleaned out for years, and the house being vacant for some time, the well had had the benefit of the leakage. One of these cesspools has now found its way into a neighbour's cellar, and is creating a very great nuisance indeed."

Dunstable.—The Town Council have prepared plans for disposing of the town sewage on an irrigation farm, the cost of which is estimated to be 5,000*l.* The opponents of the scheme say it will cost 10,000*l.*, and advocate the ash-closet system, which, they urge, will only cost about 2*l.* per house.

RAILWAY ITEMS.

Fulham and Walham Green.—Application is to be made to Parliament next session for the incorporation of a company authorised to construct railways from Hammersmith to Walham Green, Fulham, and West Brompton. Railway No. 1 is intended to commence in the parish of St. Peter and St. Paul, Hammersmith, by a junction with the Hammersmith and City Railway, at a point 75 yards, or thereabouts, south of the signal-box of the Grove Junction on that railway, and near to Hammersmith Station on that railway, and to terminate at Walham Green, in the parish of Fulham, at the point in Bishop's-lane where that lane intersects Goater's-alley and Wheatsheaf-alley. Railway No. 2 is to commence at the point of termination of Railway No. 1, and to terminate in the parish of Fulham at a point on the northern boundary of the back road 71 yards, or thereabouts, from the north-east corner of the lodge facing the back road at the entrance to the grounds of Ranelagh House. Railway No. 3 is to commence at the point of termination of Railway No. 1, and to terminate in the parish of St. Mary Abbotts, Kensington, by a junction with the Metropolitan District Railway at and between the southern extremity of the platforms of the West Brompton Station of that railway.

Devonshire.—The Teign Valley Railway Company, who are authorised to construct a railway from Crediton to the Moretonhampstead Railway, near Newton Abbot, having now nearly completed their railway to within a distance of seven or eight miles of Exeter, intend to apply in the next session for powers to extend their line to connect with the railways in that city, and also to form a branch to Chagford. This extension to Exeter will establish an inland route from that city to Newton Abbot, and avoid the interruptions that so frequently occur on the coast line between those points. Another project is on foot for the formation of a new and independent railway from Exeter to Chagford.

Dover and Deal.—The scheme for the construction of a railway between Dover and Deal will very shortly be carried out, and the connecting link in the coast line, advocated as well by travellers as by military strategists, will be furnished. The joint committee of the London, Chatham, and Dover and the South-Eastern Railway Companies have had considerable difficulty in negotiating with the landowners, and have now decided to serve those who have not come to terms with notices. After this the line will be begun as soon as possible.

Manchester, Sheffield, and Lincolnshire.—The negotiations for the joint acquisition of this line by the Great Northern and Midland companies have failed. The differences which led to this result were, it is stated on behalf of the latter two companies (1), as to the amount of rent; (2) as to the sums which the Sheffield directors claimed to retain for distribution among their proprietors. As to the rent,—the terms offered by the two companies involved the purchase of the Sheffield undertaking on the basis of a rent-charge yielding a fixed ultimate dividend at the rate of 4 per cent. per annum on the ordinary stock of the Sheffield Company, and this arrangement was to be effected in such manner as to give that company the best possible security. The proposal thus made was approved in principle by the Sheffield Board of directors. The two companies afterwards slightly modified their offer in order to meet the views of the Sheffield directors, but after the Sheffield Board meeting, on the 26th of October, it appeared that the aspect of the negotiation was changed. Instead of a rent-charge secured in the best manner consistent with Parliamentary usage, the Sheffield directors asked for a security which should take priority over even the debenture stocks of the two companies, a condition inconsistent with Parliamentary practice. As to the sums which the Sheffield directors claimed to retain for distribution among their proprietors, under the proposal of the two companies the Sheffield line was to be transferred to them as from the 1st of July, 1878, up to which date the Sheffield company would receive and pay all debts on revenue account. It was, in the first instance, claimed that any reserves accumulated on revenue account fairly belonged to the Sheffield proprietors. Taking the most favourable view, these revenue reserves, according to the two companies, could not exceed 75,000*l.*, but the Sheffield directors claimed 200,000*l.*, the difference consisting of premiums received on the issue of stocks and shares.

NEW STATUES.

Dr. Graves.—A full-sized marble statue of the late Dr. Robert James Graves, a distinguished Irish physician, has arrived at the College of Physicians, Kildare-street, in one of the principal halls in which it is intended to be placed. The statue in question is by Mr. Albert Bruce Joy, and is stated to be successful as a work of art. It represents Dr. Graves in the act of commencing to lecture, and attired in an academical robe.

Mr. John Laird.—The statue erected to the memory of the late Mr. John Laird, M.P., in Hamilton-square, Birkenhead, has been publicly unveiled by Lord Tollemache. The statue was modelled by Mr. Albert Bruce Joy, and was cast in bronze by Messrs. Masefield & Co., of Chelsea. The statue, including a thin metal base, measures in height 10 ft. 5 in., while the pedestal stands 13 ft. high, making the total elevation of the whole nearly 24 ft. Mr. Laird is represented standing with his left hand in the upper part of the breast of his buttoned coat. The right hand rests on a pedestal, whereon are drawings, the top sheet of which is an outline representation of the Birkenhead docks. The body looks to the right, and the face bends slightly downwards so as to prevent the foreshortening which would otherwise take place during a view from below. The pedestal is formed of blocks of chiselled Cornish granite, from the quarries of Messrs. Freeman & Sons, of Penryn. The base or foot of the pedestal, which rests upon a foundation of brick and cement, consists of two steps, the lowermost of which is 9 ft. square. Upon the steps is a die, which tapers upwards, and is surmounted by a moulded cap, 5 ft. 9 in. square, upon which the figure rests. The die-face of the pedestal fronting Hamilton-street has been polished, and bears the inscription, in gilt letters,—"John Laird: born June 14, 1805; died October 29, 1874."

Lord Canning.—The statue of Lord Canning is now completed, and about to be sent to India, to be placed close to Lord Hardinge's. The bronze figure of the Governor-General, bare-headed, on horseback, has been cast by Messrs. Masefield, at their works in Manor-street, King's-road, Chelsea. There are two names inscribed on the base, that of Foley, and that of Mr. Thomas Brock. To Mr. Brock the task of completing the work was intrusted when the early death of Mr. Foley removed the artist who was responsible for the original design. The whole statue is 15 ft. high, or about half as large again as the natural size. The casting has been successfully accomplished after about two years' labour in preparing the moulds, welding together the six pieces in which the figures were made, and chasing by workmen to prepare for the last touches of the sculptor.

Captain Cook.—The Legislature of New South Wales has decreed the erection of a national monument to Captain Cook, the great navigator. The monument is to take the form of a gigantic bronze statue, and has been entrusted for execution to the hands of Mr. Woolner. The work has already advanced to the stage of the clay model, which is now completed. The design represents the great sailor in the costume worn by naval men in the early years of George III. It is to be placed on a pedestal 22 ft. high, on a site overlooking the whole of the beautiful bay of Sydney, and visible over the whole extent of it, even to Port Jackson Heads.

King Robert the Bruce.—A monument to King Robert the Bruce was unveiled at Stirling on the 24th ult. The statue was formally uncovered by Lady Alexander. The monument occupies a commanding position in front of Stirling Castle, 140 ft. east of the counterscarp, and 10 ft. from the north wall of the esplanade, being placed on a spot whence may be seen a portion of the battlefields of Stirling Bridge and Bannockburn.

PROPOSED NEW BRIDGES.

The Thames.—Application is to be made to Parliament next session for a Bill authorising the incorporation of a company having for its object the construction of a bridge over the Thames, at a point between the Tower of London and the St. Katherine Docks, the bridge starting from the Surrey side at the point of intersection of Cross-street and Freeschool-street, Horselydown. It is proposed to levy tolls, notwithstanding the Act passed last session for the abolition of tolls on all Metropolitan bridges.

The Severn.—Notice has been given of an intended application to Parliament for authority to construct a bridge over the Severn, from Arlingham to Newnham, "for the passage of vehicles, foot-passengers, and animals," with necessary swing-bridges, draw-bridges, lift-bridges, or other mechanical appliances for admitting the passage of ships and vessels.

HOW CAN A RAILWAY ARCH BE MADE DRY?

A NEIGHBOUR of mine uses a railway arch for a grocery store, but it is very damp. He has had the floor concreted, but the upright brickwork looks very wet; he has tried a gas stove with atmospheric burner, which has been very costly to burn and of little use for drying; he then purposed trying an American parlour-stove, with doors to the fire, and usable either open or shut, with an iron pipe flue, but an M.D. in passing recommended a Dr. Arnott stove as the better of the two. My idea is that an open fire will suck in the damp air on the same line as radiation, and pass it off with the combustion outside the building, while the Arnott will, by the heat, raise it as steam to the crown of the arch, where it will condense and again pass down walls. I presume that each stove being a pipe stove gives the same amount of heat per pound of coke used by either. I would say that both ends are ventilated by two iron gratings, 18 in. by 12 in., fixed near the springing of the arch, and in addition four air-bricks, about 2 ft. from the ground at one end. There may be some of your subscribers who are similarly situated, while others may have mastered the difficulty. I hope that it will be for the general benefit to have it discussed. M. TOSSELL.

A MEMORIAL.

The chancel of St. Margaret's Church, Tyler's-green, Bucks, has lately undergone considerable alterations and received some additions, the roof having been lined with pitch-pine boarding, fixed and panelled with moulded ribs and gilt pateras. A reredos has also been erected of Caen stone, with carved caps and columns of Mexican onyx and other rich material, and alabaster panels, the central panels over the communion-table being in gold and coloured mosaic, by Messrs. Salviati. A new ciborium on north side, and double sedilia on south side of chancel, have also been added. The floor is laid with Messrs. Maw & Co.'s encaustic tiles, and the new altar-rail is of wrought brass, and, with the corona, was supplied by Messrs. Hardman. The whole of the interior of the church is about to undergo a thorough colour decoration in stencil patterns. A brass plate, fixed at the back of the ciborium, bears the following inscription:—

"In honour of Almighty God, and as a tribute of loving affection to his beloved wife, Dame Margaretta Rose, this reredos was erected, and the chancel of this church was enriched and beautified on the anniversary of her birth, September 16th, 1877, by Sir Philip Rose, bart., of Rayners."

Mr. H. G. Liley, of Bradmore Park, Hammersmith, was the architect.

UNDER METROPOLIS LOCAL MANAGEMENT ACT.

Messrs. Cubitt & Co., the eminent builders, carrying on business in the Gray's-inn-road, appeared before Mr. Slade, at Greenwich, in answer to two summonses, taken out at the instance of the Vestry of Rotherhithe, charging them with infringements of the Metropolis Local Management Act, in failing to give notice of the rebuilding of two houses in Rotherhithe-street, in that parish.

Mr. Stokes attended in support of the summonses, and Mr. H. D. Greene, barrister, for the defendants.

The case occupied some time in hearing, but the facts may be briefly stated. On Sunday morning, June 24th last, between four and five o'clock, a fire broke out at granaries in Rotherhithe-street, and the flames spread, setting fire to two houses, situated north and south, and numbered respectively 357 and 35. The former was occupied by Mr. Carpenter, a pawnbroker, and the windows were broken by the heat of the flames, which entered the building, and caused great damage, the whole of the original walls standing, except a wall at the back of the premises, where there were 5 ft. of the old wall left; and of the premises No. 35, the old walls stood at the height of 15 ft.

Mr. Greene contended that there had been no rebuilding, only repairing, of the premises, and that, under the 75th and 76th sections of the Act the penalty imposed was only applicable where notices were not given of the digging of foundations for new buildings. The premises in question had received extensive repairs, with the assent of the Phœnix and the Guardian Insurance Companies, by the defendants, who had for years carried out works damaged by fire, and had never given such notice.

Mr. Slade said, from the evidence before him, he did not consider that any offence had been committed, and both summonses would be dismissed.

ECCLESIASTICAL ODDITIES, ANCIENT AND MODERN.

In connexion with the restoration of Elsdon Church, an excellent account of which appeared recently in your columns, there has been discovered a series of striated long incisions on a pillar of the church close to the entrance-door, in a vertical slanting direction within arm's reach. These are supposed to be done by archers, who after attending mass previously to a battle, would, for luck, give, in this manner, a final sharpen of their arrows or other weapons before quitting the sacred edifice. In accord with the discovery of 1,000 skulls and corresponding bones found under the floor of the church, supposed to be the remains of the slain in the battle of Otterburn (Chevy Chase), close by, and the innumerable Border wars, raids, and forays, that took place in the wild locality in which Elsdon is situated, the oddity, above mentioned,—a rare one, I conclude,—is worthy of mention.

In Embleton Church, in the same county, Northumberland, there has been recently placed an odd memorial of a deceased lady. On the east wall of the south aisle, there is placed on a stone bracket a handsome majolica bowl, about 1 ft. 3 in. in diameter and 1 ft. high. This curious object is so placed by the relatives because the deceased lady highly prized it when in life, and they thought this was the best form of memorial that they could erect for her. Should this queer example be followed, would not the interiors of our churches become curiosity-shops, or exhibitions of, say, old clothes, art, or *virtu?*

Archæologia.

ZINC GAUGES.

Sir,—Referring to a letter in last week's *Builder*, signed "Architect," on zinc gauges, "The Vieille Montagne Zinc Mining Company" in 1875 did away with the Belgian gauge which has hitherto been adopted for Belgium and England, and introduced the French gauge everywhere, which is about one gauge lighter than the Belgian.

I am not aware that other manufacturers adopt a different gauge, but, no doubt, "Architect's" safe plan is always to specify the weight per foot. But if where he used to specify No. 15 gauge, he now requires No. 16, and so on, always one gauge higher than the old, he will get what he has been accustomed to and approves.

"The Vieille Montagne Company" still employ a staff of architects in London and several chief towns in the provinces, whose duty it is to render all assistance and information to those who desire it, without charge. I inclose printed list of gauges and weights.

James Edmeston,
Architect to the V. M. Company.

A PIECE OF NEWS AS TO THE STRIKE.

Sir,—At a late meeting of the Pontack Lodge of the stonemasons at Liverpool, it was considered "that the introduction of foreign labour must now and for ever be crushed;" and it is anticipated at the next meeting of the Central Stonemasons' Committee at Cardiff a proposal will be made to the members throughout the kingdom that steps be immediately taken to withdraw custom from all bakers who cannot produce a sworn certificate from the Lord Mayor of London that they use no foreign flour whatever, and employ no foreign men in making bread; and further, that every exertion be made now and for ever to stamp out the use of tea and sugar and all foreign articles. This latter resolution will, it is understood, have the effect of keeping Cleopatra's Needle out of England, as it comes under the category of foreign stonework.

Tradesmen in any way offering foreign goods for sale are invited to close their shops, *now and for ever*, or be in peril of a universal crushing (ramming, if preferred) by stonemasons.

English stonemasons working abroad must consider this a notice to return home forthwith, every man to his own parish.

Bob.

AN EXPRESSION OF THANKS.

Sir,—As a reader for several years of the *Builder*, I cannot refrain from thanking not only yourself for inserting, but the able and well-meaning writer of "Liverpool, its Body and Mind," which I find in your valuable paper of November 24th, and I can say from experience that this kind of writing tends to improve the minds of all. There is so much of the competition and ambition for wealth constantly pressing upon the minds of business men, especially the young, also the love for the gay and fashionable, that the desire to improve the moral tone of the lives and actions of themselves and those around is entirely lost sight of, and you will agree with me that there are plenty of men to be found in the building trade who will declare that as to a contractor and builder being a reading, thoughtful, improving, and strictly moral man, it is impossible. And so it is if the mind is constantly to be bent upon the everyday affairs and anxieties of business life; but I do not see why, if such wholesome food for the mind is regularly taken as we have in the article to which I refer, and others in the *Builder*, readers, though they are in daily contact with the roughest portion of our fellow men, should not become good and able men for society, a credit to themselves, their craft, and their country. If you will kindly insert these few remarks, I will endeavour to practise what I preach.

J. P. W.

SEA SALT.

Sir,—I have recently built a house, mainly of brick made in a yard about four miles from the sea. The bricks are to some extent impregnated with salt, and when the damp weather comes on, or there is a change in the weather from dry to damp, wherever there is a salty brick, there a damp place shows, and I am afraid that no paper will long remain on the walls. After a time, too, a frosty appearance shows on the walls where the damp places have shown. I have had some of the walls plastered with Parian cement, and painted over it; but the damp places have come through the paint, and the same frosted appearance after a time.

Can any of your readers inform me what I can place over the wall so as to prevent the dampness and frostiness above referred to from showing?

I have been recommended to use shellac dissolved in spirits and applied with a brush, also silicate; but, on the other hand, I hear that neither will answer the required end.

Porter Wilson.

BUILDINGS, FINSBURY PAVEMENT.

Sir,—A week or two ago you gave an elaborate description of the buildings recently erected by Mr. Cave in Finsbury Pavement, Moorgate-street, in which most of the parties concerned were duly recognised, but in which our names as contractors for the ironwork (of which we supplied a large quantity) were omitted. If you will spare a line or two to rectify this omission you will much oblige

R. H. & J. Pearson.

DISPUTE AS TO WAGES.

OLORENSHAW AND HITCHIN *v.* HORSELEY.

At the Birmingham Public Office, on the 21st ult., Thomas Olorenshaw and Charles Hitchin, members of the Amalgamated Society of Carpenters and Joiners, and in the employment of Messrs. Horseley Brothers, builders and contractors, summoned their employers for 9s. 8d. and 10s. 4d., arrears of wages alleged to be due to them in respect of carpenters' work done, at the rate of 8½d. per hour.

It appeared that the men worked up to the 16th ult., having been paid all arrears on the previous Saturday. The foreman gave them notice to leave on the ground that they had been too long over their work, and tendered them 7s. 8d. each in payment of Saturday, Monday, and Tuesday's work, instead of the amount claimed. The point in the case was whether the men ought to be paid by valuation of the work done or by the hour.

Mr. Maher, for the complainants, stated that his clients had been in the employment of the defendants for upwards of nine months; that they had been paid a rate of wages customary in the trade,—viz., 8½d. per hour; that no complaint had been made as to the manner in which they had done their work, and that they were consequently entitled to 8½d. per hour up to the time of their notice.

Mr. Ansell, for the defence, said the two men had delayed too long over the work entrusted to them, the result being a loss to their employers, and a justification of the amount tendered. He also submitted that the complainants were bound by the printed rules of the society,—one of which referred disputes to arbitration.

Mr. Kynnersley, the magistrate, said such rules did not do away with the jurisdiction of that Court. He thought the men were entitled to the amount claimed, and gave his decision accordingly.

HOSPITALS.

West London.—The corner-stone of the west wing and out-patients' department of the West London Hospital, Hammersmith, was laid on the 19th ult. The out-patient department will consist of six consulting-rooms and a sorting-room for the house surgeons, and a large waiting-room for male and female patients. The front part will contain three wards,—a woman's accident ward, a man's accident ward, and a children's ward, with twenty beds. A lift will also be erected, capable of taking a patient, either on a stretcher or bedstead, to the upper wards, and will also communicate with the operating theatre. The sum of 11,000*l.* is required to complete these additions.

Hemel Hempstead.—On the 17th ult. H.R.H. the Princess Mary Adelaide opened the new West Herts Infirmary at Hemel Hempstead, of which Messrs. Coe & Robinson, of London, are the architects. The old infirmary was founded in 1826 by Sir John Sebright, who munificently expended 13,000*l.* on its building and endowment. The new building was commenced two years ago. The sum of 8,018*l.* has been actually received on account of the building fund. The whole cost when completed will considerably exceed 13,000*l.* The new building will hold fifty patients.

London.—The rebuilding of a portion of St. Bartholomew's Hospital, with a view (amongst other things) to the better accommodation of the medical school, is now in progress. This important scheme, like so many other works of public utility, is due to the energy of Alderman Sir Sydney H. Waterlow. Mr. Edward l'Anson is the architect.

SCHOOL BOARD SCHOOLS.

Pocklington.—New Board School and master's house are now being erected at Melbourne, near Pocklington, from designs by and under the superintendence of Mr. W. G. Penty, architect, of York, at a cost of 1,027*l.* including boundary walls, out-offices, and school fittings, the works being carried out by Messrs. P. J. & W. Harrison, contractors, York. The schools are to accommodate 110 scholars, and will be heated with Shillito & Shorland's Patent Manchester School grates.

London.—Sir Charles Reed has formally opened a new Board School situated in "D" street, Queen's Park Estate, Harrow-road. The school, which is built in the Queen Anne style, is capable of seating 279 boys, 271 girls, and 304 infants. Mr. E. R. Robson was the architect.

SCHOOL BUILDING NEWS.

Radcliffe.—New National schools have been completed and opened at Radcliffe. The architects were Messrs. Maxwell & Tuke, of Bury. The schools are planned in the form of the letter T, the top portion being the girls' school, 60 ft. by 30 ft., and the stem the boys', 50 ft. by 30 ft. The division between the two schools is formed partly with folding doors and partly with revolving wooden shutters, so arranged that in the event of a meeting the whole can be thrown into one. The platform is placed at the top of the T opposite to the stem. There are two entrances, one for girls and one for boys, with a class-room by each entrance, together with lavatories and cloak-rooms. The building is of brickwork, with stone dressings. The woodwork inside is pitch-pine, varnished. The style is Gothic. The contracts have been executed by separate tradesmen: the stonework by Messrs. Openshaw & Buckley; brickwork, Messrs. Stevenson & Holt; woodwork, Mr. John Allen; slating, Mr. John Smith; plumbing, Mr. Wm. Brierley; plastering and painting, Mr. Joseph Brooks, all of Radcliffe; heating apparatus, Mr. Joseph Downham, of Bury. The total cost will be about 2,400*l.*

Tonbridge.—The foundation-stone of a new Baptist Sunday School and Lecture-room at Tonbridge was laid on the 6th ult. The room is to be built by Mr. T. Wickham, of Tonbridge, from designs by Mr. W. J. Brooker. The cost is estimated at about 715*l.*

CHURCH-BUILDING NEWS.

Blewbury.—The chancel of Blewbury parish church has been re-opened for service, after restoration. The building is one of the most interesting in the county of Berkshire. Some portions of it are thought to be of Saxon origin. About two years and a half ago the restoration of the nave was commenced. The roof was renewed in solid oak, in exact accordance with the old one. The floor was lowered to the ancient level, showing the bases of the pillars. The pews and galleries were removed, and the floor paved with encaustic tiles, the portion under the seats being covered with White's patent wood-block paving. This portion of the church was opened for Divine service in the spring of last year. The restoration of the chancel was commenced in March last, the funds being provided by the parishioners, aided by a grant from the Ecclesiastical Commissioners. The contract was taken by Mr. Martin, of Hereford. The work has been carried out under the direction of Mr. Dolby, architect, Abingdon. The original floor-lines have been regained, and the arches and stone-groined roofs are exhibited in their fair proportions. The north and south aisles remain in a very dilapidated condition for want of funds. The sum already spent is about 1,600*l.* An equal amount is needed for the completion of the work.

Thorpe Malsor.—On the 6th ult. the parish church of Thorpe Malsor, Northamptonshire, was re-opened, after being closed a year for purposes of restoration. The church is in style a mixture of Early English and Tudor architecture. Most of the work of the nave and chancel is entirely new, and the architect for the restoration, Mr. Clapton Rolfe, of Reading, has worked on the lines of the old work. The body of the church is mainly built of sandstone. The chancel has been entirely rebuilt, and many of the old features re-introduced. The roof is groined very elaborately with oak, the beams springing from corbels representing winged angels, carved in stone. Three sedilia have been set into the south wall of the sanctuary. The chancel is divided from the sanctuary by a brass railing, supplied by Mr. Hardman. The floor is laid with encaustic tiles, supplied by Mr. Godwin, of Hereford. The reredos is of carved oak, gilt, having in the centre panel a representation of the *Agnus Dei*, in *basso relievo*, surrounded with mystic symbolisms. The panel flanking this on the right contains a group of saints and virgins in adoration, the principal figures being St. Mary Magdalene, St. Ethelreda, and St. Catherine. The panel on the left contains the representations of St. Thomas of Canterbury, St. Benedict, and St. Edmund. The re-table is of alabaster, and on each side is an alabaster pillar, which it is intended to cap with the heads of cherubim. The choir-stalls are of oak, and the ends of the benches are carved. The subjects are in *basso relievo*,—the "Virgin and Child," "St. George and the Dragon," "St. Leonard," and that mystic bird the "Pelican." This work is by Mr. Hems, of Exeter. On the north side of the building a small private chapel has been formed out of the Maunsell vault, and an Early English arch, which was closed, has been opened on the west. The pulpit is formed of Caen stone, resting upon a pedestal of Ketton stone. A new porch has been constructed on the south side of the nave. The restoration has been carried out, at a cost of 5,000*l.*, by Mr. John Gee, of Daventry.

Burwell.—The restoration of Burwell Church has been advanced a stage towards completion by the dedication of a new reredos, a restored screen, and a new organ. The nave of the church was restored fourteen years ago at a cost of 2,000*l.*,—the chancel nine years ago by the University at a cost of 1,200*l.* The reredos of carved clunch from the quarries in the parish, executed by Messrs. Rattee & Kett, carvers, Cambridge, from the designs of Mr. A. W. Blomfield, was erected through the liberality of the University of Cambridge, the patrons of the living. The new organ, with other works in the chancel, have been carried out by the joint contributions of several members of the University, landed proprietors, and a few parishioners. The organ is by Messrs. Bevington, of London.

Tolleshunt Knights.—The nave of the parish church of Tolleshunt Knights, Essex, was re-opened on the 1st ult. The nave has been fitted with open benches, the chancel with suitable choir-stalls, the old ceiling taken down, and the fine oak rafters brought to sight, the ceiling extended by pulling down the old belfry. The exterior has also been improved by the erection of a red brick bell-tower. A heating apparatus has also been fitted. The architect is Mr. R. Armstrong, and the builder Mr. R. Bartram, Aylsham, Norfolk. The parish is extensive, and is on the line of the ancient Roman way from Maldon to Colchester, as near Barnwalden Roman pavements have been dug up. In the chancel of the old church is an effigy of a Knight Templar and some defaced monuments of the Poteshall family. It is the mother church of the Tolleshunts.

Bruton.—Bruton Church, Somersetshire, has been re-opened on the completion of the restoration of its nave and aisles. The works have extended over seven years, and the reconstruction of the chancel has yet to be undertaken. The church is wholly of fifteenth-century date, having been rebuilt in the time of Henry VII., a short time after its beautiful western tower had been rebuilt. In many respects the church is of the same character as St. Mary Magdalene, Taunton, but its roofs are finer, and are, indeed, almost unrivalled in the district for their beauty and elaborate workmanship. Unfortunately the gutters had been allowed to get into a bad state, and it became necessary to take the roofs down bay by bay, and splice new ends on to the beams and other defective timbers, also to rebuild the north arcade and clearstory. Much of the carving, and many of the carved angels in the cornice and under the beams had disappeared; these have been replaced by new. The north porch is continued up as a tower, three stages in height. Under the chancel and a portion of the nave, is a crypt of earlier date than the church, vaulted in six bays; this, after being used as an ossuary, was made a vault by the Berkeley family, to whose ancestor, Sir Maurice Berkeley, was given the property of Bruton Abbey (an Augustine friars' foundation), and also the manor of Bruton. The abbey church has utterly disappeared, and but few remains of the buildings are to be found beyond the prior's house, and a great buttressed wall, probably that of the refectory. The church has been entirely re-seated, working in some fine old seventeenth-century bench ends, and a richly-carved screen, bearing date 1620. The niches between the clearstory windows have been filled with figures of the Apostles, by Mr. Owen Thomas, of London; and the great west window has been filled with stained glass by Messrs. Clayton & Bell, and others are to follow. The chancel, an erection of the eighteenth century in the Grecian style, is to be reconstructed to harmonise with the nave. The works were commenced under the late Mr. Slater and Mr. R. H. Carpenter, and have been continued under him and his partner, Mr. B. Ingelow, Messrs. Clarke & Son, of Bruton, being the builders.

Langham.—The little church at Langham, which has been entirely rebuilt, with the exception of the chancel, has been re-opened by the Bishop of Ely. The work of renovation has been carried out by Mr. Alfred Andrews, builder, of Bury St. Edmund's, who has, under the supervision of the architect, Mr. J. H. Hakewill, utilised as much as possible the old materials, and, in one instance, has replaced a window in precisely the same position it originally occupied; whilst the character of the Early English architecture of the church has been preserved. The exterior has been improved by the addition of a bell-turret at the west end; the roof is also ornamented by terminal crosses. A wooden tower formerly occupied the place of the bell-turret. The roof of the nave is covered with blue Staffordshire tiles. The whole of the roofs, together with benches, pulpit, reading-desks, &c., are of English oak. On the south side of the church an open porch of English oak has been constructed as the principal entrance. The church is warmed by an underground heating apparatus, supplied by Mr. Porritt, of Bolton. The entire work of rebuilding the nave has been undertaken by Mrs. F. Maitland Wilson, as a tribute to the memory of her husband, Colonel Fuller Maitland Wilson, M.P. for West Suffolk. The undertaking has cost about 2,000*l.*

Peak Forest.—A few days since the Bishop of Lichfield consecrated a new church at Peak Forest, the gift of the Duke of Devonshire. The new building is intended to replace the old church, which was built about the middle of the seventeenth century, and was dedicated to "St. Charles the Martyr." The building adjoins the old church, and is designed in the Perpendicular style. The main entrance is by a porch formed by the tower, which is square, and affords room below for a ringer, and above for a bell-chamber. Two stained windows have been placed in the church, one by Mr. Samuel Needham, of Rushup, and the other by Mr. William Claye and his sisters, as a memorial to their mother. The chapel and reredos are also the gift of Mr. S. Needham. The plans of the building have been prepared and the work carried on under the direction of Mr. Henry Cockbain, of Middleton, near Manchester. It was originally the intention of the duke to restore the old church, but on examination it was found that the material had been so damaged by fire some years ago as to necessitate the building of a new one. There are many peculiar features connected with the old church, amongst which is the fact that it was at one time an English Gretna Green, where, it is said, any one at any time could be married without previous notice.

Aldsworth.—The chancel of the parish church, Aldsworth, has been re-opened, after undergoing restoration. The restoration has included a new chancel-roof and arch, organ-chamber, and vestry, flooring of encaustic tiles, choir-seats, oak reredos, &c. The plans were prepared by Mr. G. R. Clarke, and the work has been carried out by Mr. J. Field, of Aldsworth, and Mr. W. Mills, of Foss Bridge.

Ordsall.—Ordsall parish church has been re-opened by the Bishop of Lincoln, after restoration and enlargement. The work was greatly needed, for the old building was rapidly hastening to decay. The nave, aisles, and chancel are completely new. A new organ has been supplied by Messrs. Brindley & Foster, of Sheffield, at a cost of something like 500*l.* Mr. Hind, of Nottingham, was the architect, and Mr. John Wilson, of West Retford, the builder.

Weaverham.—The parish church of Weaverham, Cheshire, has just been re-opened, after restoration. The old pews have been all cleared away, and open benches of oak substituted for them. The fabric was originally much disfigured by the gallery which stood at the west end, completely filling up the tower-arch and hiding from view the west window in the tower. The gallery has been completely removed, the tower-arch thrown open, and the window filled with stained glass. The windows of the church have had new stone mullions inserted, and the stonework generally has been repaired and made good. The new font, presented by Mr. R. Heath, of Hefferstone Grange, is of white marble, with an oak cover. The marble work of the font was supplied and worked from the architect's designs, by Mr. John Cassiday, of Liverpool. The church will be warmed by means of hot-water pipes, this part of the work being undertaken by Mr. Seward, of Preston. The lamps and pendants have been supplied by Messrs. Hart, Son, Pearl, & Co. The general contractor for the works has been Mr. Robert Fairhurst, of Whiteley, and the plans for the work (except that in the chancel, which was done under the direction of the Ecclesiastical Commissioners) were prepared by Mr. Douglas, architect Chester.

BUILDERS' BENEVOLENT INSTITUTION.

The forty-eighth election of pensioners on the funds of this institution was held on Thursday at Willis's Rooms, St. James's, the president, Mr. William Higgs, in the chair. There were three candidates, all of whom were elected,—an event without precedent in the history of the Institution, which has now been established thirty years. Including the three pensioners just elected, there are now forty-six recipients of the funds of the charity, twenty-three men and twenty-three women, the men receiving 30*l.* per annum and the women 24*l.* The names of the new pensioners are John Morris (who was a member of the committee of the Institution twelve years, and also a subscriber), Mrs. Rebecca Brown (widow of Mr. John Thomas Brown, a subscriber to the Institution), and Mrs. Mary Ann Ebbs (widow of Mr. John Ebbs, a subscriber to the Institution from its foundation for twenty-four years).

The President remarked that the committee were able in this instance to elect all the candidates who presented themselves, owing to the satisfactory state of the finances of the Institution, to maintain which, however, it would require continued watchfulness on the part of its friends. The sum required to pay the pensions and to meet the necessary working expenses was about 1,700*l.* a year, which, after deducting the 600*l.* a year coming in from the 20,000*l.* invested in the Public Funds, left a sum of 1,100*l.* to be got together every year by subscriptions and donations. He thought the Institution might fairly hope to obtain this sum annually. A vote of thanks to the President terminated the proceedings.

THE MASONS' STRIKE.

The Strike Committee of the Masons' Union have this week issued what they are pleased to call a "manifesto," which has been published in all the newspapers, and which concludes as follows:—

"We in all confidence appeal to you to assist us in fighting this battle, which is not a battle of the Masons' Society against the master builders of London, but against an organisation that has for its especial object the extermination of all trade organisation, and reducing the English workman to the contemptible position of a slave."

The London Master Builders beg to be held excused from any such motives. They do not wish to be concerned with or interfere with the rules and practices of any trade organisations whatever, so long as these rules and practices are consistent with common sense and honesty. They object to the trade unions restricting men's labour so that the best men should be made to pretend to work instead of working, and so not to out-do the slow and incompetent man. They object to rules which prevent the best men from rising in their position and earning more money, and the constant interference exercised by the Masons' Union through the agency of shop stewards, whose chief business seems to be to put all hindrances possible in the way of the industrious artisan and contractors, of whom I am

ONE.

Books Received.

Notices of the Historic Persons buried in the Chapel of St. Peter-ad-Vincula, in the Tower of London. By DOYNE C. BELL, F.S.A. London: John Murray.

As the title shows, this volume deals especially with the eminent persons who from time to time have been buried in and about the Chapel of St. Peter-ad-Vincula; but it also includes a carefully-written history of the chapel itself,—which has undergone several modifications during these later days,—and is illustrated with a number of good engravings, which include representations of other parts of the Tower. "In truth," as Macaulay says, "there is no sadder spot on earth than this little cemetery. Death is there associated, not as in Westminster Abbey and St. Paul's, with genius and virtue, with public veneration and with imperishable renown; not, as in our own humblest churches and churchyards, with everything that is most endearing in social and domestic charities, but with whatever is darkest in human nature and human dishonesty; with the savage triumph of implacable enemies, with the inconstancy, ingratitude, and cowardice of friends, with all the miseries of fallen greatness and of blighted fame." The notices of the persons buried here have been very carefully compiled, and the volume makes very pleasant reading. It is appropriately dedicated to her Majesty the Queen.

VARIORUM.

"ROUND ABOUT LONDON," by a Fellow of the Society of Antiquaries (Stanford), is a little book which is not intended to compete with the two very interesting volumes on the same topic recently published by Mr. Murray; it nevertheless contains sufficiently-long notices of places within a circle of twelve miles round the metropolis to make it very valuable to those who contemplate short walking excursions. Hatfield, Uxbridge, St. Alban's, and other well-known spots, are all fairly treated in this little work, which has what Murray's book at present has not, viz., a map of the environs of London, greatly enhancing its usefulness to those who may be seeking from time to time for places to visit.——The *Church Builder* (Rivingtons) for 1877 makes a pretty little volume. This work has been enlarged, and the price increased, and now it includes more information than was previously the case, together with a number of very good illustrations.—— Persons with the humblest means seeking to obtain some knowledge of science can have no difficulty at this time in finding works of small cost affording them what they desire. We have on our table at this moment a dozen books of the kind; as, for example, "The Elements of Machine Design," by W. Cawthorne Unwin (Longmans); "Practical Treatise on Mill-Gearing," by Thomas Box (Spon); two volumes of Lardner's "Handbook of Natural Philosophy," enlarged by Benjamin Lowey (Crosby Lockwood & Co.) (one treating of "Mechanics," the other of "Heat"); not to mention a number of others, all of them being thoroughly reliable works, and published at low prices.——"The Amateur Mechanic's Practical Handbook," by Arthur H. G. Hobson (Longmans), describes chiefly the different tools required in the workshop, the uses of them, and *how* to use them. This is not the only book of its kind recently published, but it is in a more condensed form than some others, and will be found very useful, at any rate in the colonies.——"Locomotive Engine-Driving," by Michael Reynolds (Crosby Lockwood & Co.), is a practical manual for engineers in charge of locomotive engines. It is evidently the work of one well acquainted with the subject, and if the drivers and firemen of locomotive engines throughout the kingdom could be brought to read it, they, as well as the public, would be advantaged.——"The Compendium of Architectural Sheet-Metal Work," edited by A. C. Kittredge (Sampson Low & Co.), is an American work,—a "trade book" rather than otherwise; but it contains such a very large amount of information on the subject of which it treats,—giving rules and directions for estimates, tables of roofing, of brackets, modillions, friezes, designs and prices of architectural ornaments, and drawings of cornices, window-caps, and so forth,—that we may safely recommend it for reference on this side of the Atlantic.—— "The Geological Survey of Indiana," made during the year 1875, by E. T. Cox, State Geologist (published by the Centennial Company, Indianapolis), includes not merely accounts of the geology of the various parts of the State, but records the existence of all antiquities met with in the course of the survey. In Vanderburg county, the earthworks appear to have particular interest, and are described at some length. The United States Government deserve great praise for devoting money to these surveys, and Mr. E. T. Cox appears to have proved conclusively that he was the right man to be employed to carry out their views in the present case.——It is to be hoped that the attention of the Local Government Board authorities will be increasingly directed to the separation of pauper children and invalids from adult paupers and from unsuitable nurses, in consequence of what has recently occurred in a workhouse, near Birmingham, where an attendant has been sentenced to two months' imprisonment for cruelly beating, with a leather strap, a miserable pauper, seventy-five years of age, blind, dumb, paralysed, and bedridden. In connexion with this case, the appearance, in the *Contemporary Review* (December, 1877), of a very valuable paper on "Pauper Children," by Mr. Francis Peek, is very timely. He advocates the enactment of a measure to prohibit the training of children in the same buildings with adult paupers, and to provide for their being brought up exclusively in District Schools, or in grouped Village Homes, on the Mettray plan, or by the Boarding-out system, individually, under regular supervision. He shows that the latter system is universally adopted in Scotland, where it works admirably in its moral, sanitary, and economical results.

Miscellanea.

The "Adelphi" and the Brothers Adam. In an interesting lecture delivered the other day at the hall of the Society of Arts (in connexion with the Working Men's Club and Institute Union), Dean Stanley observed that as they went through London or elsewhere it was very instructive to ask always what was the meaning of the name of the place where they happened to be; he always did. To take the place where they were at that moment,—John-street, Adelphi, Strand. What did that mean? Some of them, of course, knew. Any one knowing Greek knew that Adelphi meant brothers; but why was it called "brothers"? It was because there were four brothers named Adam, who came from Kirkcaldy. These brothers were great architects, and they determined to rescue the part of London where they were at that moment from the mud of the Thames; they were, in fact, the founders of the Embankment. They were named Robert, William, James, and John, and those streets were called after them, and would continue a memorial of their energy and how they kept together by their strong brotherly affection.

Royal Scottish Academy.—The annual meeting of the Royal Scottish Academy was held on the 14th ult., Sir Daniel Macnee, president, in the chair. The principal business before the meeting was the election of three Associates in room of Messrs. George Reid, J. B. Macdonald, and John Smart, who were appointed Academicians in February. The *Scotsman* understands that the following gentlemen were elected to the vacancies in the order named:—Messrs. W. D. Mackay and D. W. Stevenson, Edinburgh; and J. Docharty, Glasgow. A fourth Associateship remains to be filled up; and there will be another vacancy created in February by the promotion of an Associate to the rank of Academician, in room of the late Mr. James Drummond.

The Royal Windsor Tapestry Works.—The success which has attended the tapestry works at Old Windsor has necessitated their removal to Manor Lodge till a larger factory is erected for the accommodation of additional workmen. The tapestries which will be shown at the Paris Exhibition next year are nearly finished. A cartoon, representing a stag-hunt in the reign of Henry VII., and one of several intended as designs for tapestry ordered by Mr. Christopher Sykes, M.P., has just been completed by Mr. E. M. Ward, R.A. The old tapestry damaged by the recent fire at Inverary Castle is in course of restoration at the works.

St. Paul's Churchyard.—The *City Press* hears that the efforts which have been made to secure to the people of London the ground round St. Paul's Cathedral have been successful, and that an agreement will shortly be entered into between the Dean and Chapter and the Corporation for this purpose. The contemplated improvements include lowering the palings, remodelling the ground, planting trees, and making the necessary pathways. We have long urged that the railings here should be re-arranged.

Paris Exhibition, 1878.—There will be an International Show of Breeding Stock in conjunction with the Universal Exhibition, and very handsome prizes will be given. Programmes and "Entry Forms" can be obtained on application at Canada Buildings, King-street, Westminster, S.W. Intending exhibitors should make their entries by December 20th. The general superintendence of the Agricultural Department has been entrusted to Mr. Brandreth Gibbs.

A Park from the Queen.—At a special meeting of the Heywood Local Board it was announced that the Queen had presented to the town twenty acres of land for the purposes of a public park. The money has been set apart by the Queen out of a sum exceeding 10,000*l.* which fell to her as Duchess of Lancaster through the death, without heirs, of Mr. C. M. Newhouse, of Heywood.

Ventilation, Wolverhampton Town-hall. Mr. G. Eastlake Thoms, borough engineer and surveyor, Wolverhampton, has presented a report to the public works committee as to the ventilation of the committee-rooms of the Town-hall. He says that, having carefully investigated the systems now in use, he has come to the conclusion that the system adopted by the Sanitary Engineering and Ventilation Company, London, is, on the whole, that which he has most confidence in recommending. By this system the admission of the air is accomplished by making an opening in the outer wall, generally at the floor-level, through which the air flows into the room by means of a vertical tube or pipe (about 6 ft. high for ordinary apartments). In passing through this tube the air attains a velocity which carries it towards the top of the room, gradually spreading out as a spray, thereby mixing with the warmer air of the room, and then descending gradually. By this arrangement, the air at the top of a room is as fresh as that at the lower part, by reason of its being continually changed, and the temperature is also uniform throughout. Provision is made for intercepting dust, "blacks," and other dirty particles. Directly the air is admitted through the perforated grating on the outside of the opening, it is deflected or thrown down on to a body of water, which at once arrests the floating particles without interfering with the inflow of the air. This water can be renewed, and the water-tray with its accumulation of dirt flushed out by occasionally pouring water down the tube.

The Patent Laws.—In his address at the opening meeting of the Society of Arts on the 21st ult., Mr. William Hawes dealt with a large number of interesting topics coming within the scope of the Society's operations in the promotion of arts, manufactures, and commerce. Among the subjects dealt with was patent-law reform, Mr. Hawes remarking that "one of the greatest difficulties in connexion with the patent-law is the determination of what is a new invention. It can hardly be maintained that a modification or improvement in the arrangement of parts of a new machine can entitle the improver to a monopoly of the same duration as that given to the original inventor. An original inventor, or discoverer of a new process beneficial to the country at large, deserves reward. But, except in very exceptional cases, does the patent-law secure to him this reward? It would be better that a reward, however large, should be given by the State, when the novelty and public utility of an invention had been proved, than that thousands of useless patents should be granted, by which progress in invention is retarded, and difficulties and impediments placed in the way of a real genius, who, after years of labour, perfects that which he has long striven for, and then finds that he cannot proceed without first meeting demands made upon him for claims for rights obtained under scheming and useless patents, taken out mainly for speculative purposes."

The Thames Steam Ferry, recently opened for traffic, is situated almost immediately over the Thames Tunnel. The works were commenced in October, 1875, when the first pile of the wharf on the Wapping side of the river was screwed by the then Lord Mayor, Alderman Stone. The landing-stages on each side are raised and lowered to suit the state of the tide by hydraulic machinery invented by Mr. F. E. Duckham (the engineer from whose plans the whole of the work has been carried out), and the means of communication are two ferry-boats, the *Pearl* and the *Jessie May*, each of which is 82 ft. in length by 42 ft. in breadth, with a carrying capacity of fifty tons, accommodation being afforded for twelve two-horse vans, besides foot-passengers. The tariff is 1d. for a pedestrian; cattle, 6d. per head; cab, with fare, 8d., returning empty, free; and other vehicles from 8d. to 2s. 6d., according to the number of horses by which they are drawn, and whether empty or laden.

St. Luke's Church, Old-street. — This church has been re-opened. It has been closed for some months, in consequence of certain dilapidations. The woodwork of the seats had decayed, coffins had to be removed, and there was the want of general repair. The Ironmongers' Company have helped the work of restoration, Mr. Warren De la Rue has subscribed 250*l.*, and with the aid of the parishioners, the funds for the renovation have been approached in amount. The walls have been underpinned, and the interior of the fabric restored. Mr. Blomfield was the architect.

Cocoa House, Chester.—On the 17th ult., the "Little Nag's Head Cocoa House," Chester, was opened by the Duke of Westminster, the owner. Formerly a public-house, the building has been altered to suit its new purpose. The ground-floor contains a restaurant, with smoking-room, kitchen, &c., in connexion therewith, and two staircases to the first-floor. On this floor there is a large club or refreshment room, extending the whole width of the front, and a separate room for women in the rear, with convenient offices. The attic floor is occupied by a club-room overlooking the street, a manager's room, and bedrooms at the back. The frontage of the old building was in a line with the adjoining houses; but the new front has been set back on the ground story to allow greater width of pavement, the upper stories being projected to increase the area of the rooms and protect the bay windows. The timber framing of the front is executed in English oak, filled in with thin bricks on the first floor, and sgraffito work above, the latter being carried out by Messrs. Trollope & Sons. Messrs. F. T. Farrimond & Co., of Chester, were the general contractors. The carving of the tracery on the beams, &c., has been executed by Mr. Brown, the brickwork by Mr. Parrot, the plumbing by Mr. Isaac Williams, and the painting by Mr. Ellis, all of Chester; the whole from the designs of Mr. John Douglas, architect.

The Rivers Pollution Act.—The third inquiry under the twelfth section of the Rivers Pollution Act was opened on the 23rd ult., at the town-hall, Barnet, by Mr. R. Rawlinson, C.B., C.E., the inspector appointed for the purposes of the above Act by the Local Government Board. The Local Board of Barnet, for some time past, have been put to great expense and inconvenience through legal proceedings which have been brought against them in consequence of the pollution of Dollis-brook by the sewage from their sewage works. Both in the Chancery Division of the High Court of Judicature and at the Hereford Assizes in March last, proceedings had been instituted against them, and in both cases they were mulcted in costs. They now applied to the Local Government Board for a certificate under the 12th section of the Rivers Pollution Act, 1876, to the effect that the means used by them for rendering harmless the sewage matter flowing or carried into Dollis-brook (the cause of the litigation) from their sewage outfall works, are the best or only practicable and available means, and the inquiry was opened by Mr. Rawlinson for hearing the circumstances of the case, and of deciding as to the granting of such certificate. The inquiry was adjourned.

Blasting by Means of Dynamite.—Some interesting experiments to show the capabilities of dynamite as an explosive for blasting purposes, fired either by electricity or by fuse, have just taken place at the Forcett Limestone Quarries, near Darlington. The experiments, which were conducted by Mr. John Harris, for Nobel's Explosives Company, are asserted to have demonstrated the superiority of dynamite over gunpowder and other explosives as to safety, economy, and strength by the immense displacement and breaking up of the stone. It is also stated to have been proved that dynamite requires a strong percussion-cap to explode it, and that when set fire to in any other manner it merely burns harmlessly away.

Liverpool Operative Plumbers' Association.—On the 19th ult., the eleventh annual tea-party and ball in aid of the Widows' and Orphans' Benevolent Fund of the Liverpool Operative Plumbers' Association, took place at St. George's Hall. Upwards of 800 persons sat down to tea. After tea the chair was taken by Mr. Edward Whitley, Mr. David Bage, secretary of the ball committee, read the annual report, which showed that the amount realised by last year's ball was 126*l.* 19*s.* 2d. Of this sum there had been paid to widows and orphans 58*l.* 15*s.*; to afflicted members, 49*l.* 19*s.*; and after paying some expenses there remained a balance of 14*l.* 19*s.* 4d.

Bow-street Police-court. — Application is intended to be made to Parliament in the ensuing session, on behalf of the Commissioners of her Majesty's Works and Public Buildings, for an Act to empower the Commissioners to acquire and take, by compulsion or agreement, certain lands, houses, &c., for the purpose of erecting buildings and conveniences in connexion with the authorised new police-court, in lieu of the existing Bow-street Court.

Stow-on-the-Wold.—The foundation-stone of a new town-hall for Stow-on-the-Wold has been laid. The building, which will occupy a conspicuous position in the Market-square, will consist, on the ground-floor, of library, 26 ft. by 18 ft., and reading-room, 31 ft. by 17 ft.; gentlemen's cloak-room, porch, hall, staircase, and custodian's apartments; and on the first floor will be the assembly-room, 50 ft. by 24 ft., with committee and ante-rooms, and ladies' cloak-room. The building will be Gothic in style. It will be built of Farmington stone, and roofed with Kinton Hill stone tiles. Mr. Medland is the architect, and Mr. Estcourt the builder, Mr. Saunders acting as foreman of works. The cost will be over 4,000*l.*

The Darien Canal Scheme.—A note was read at the last meeting of the Academy of Science, Paris, from M. de Lesseps, who at the last Geographical Congress was appointed President of a Commission to consider the best means of accomplishing international communication across Central America. The Commission, he stated, were in favour of the project of a canal, 44½ miles in length, that would traverse the Darien isthmus from the river Tuyoa to the Atlantic, and would have the immense advantage of not requiring any locks. A tunnel, however, 8¾ miles long, will have to be constructed, and to provide a passage for the largest vessels it will have to be 118 ft. high. The cost of the tunnel and other works is estimated at twenty-five millions sterling.

Experiments with Hydrants.—The gas and water committee of the corporation of London have lately carried out a series of experiments in connexion with the hydrants which have been laid down in several parts of the City for immediate use in case of any outbreak of fire. No fewer than 100 of these hydrants have been completed and are ready for use, and about 150 more will soon be ready. It is proposed that there shall be 1,000 of them in the City alone for fire-extinguishing purposes. At the experiments referred to the hydrants were in turn practically tested at the Royal Exchange, Dowgate-hill, the Cannon-street Station of the South-Eastern Railway, and several other places.

Improvement of Dwelling Houses.—On the 17th ult. the fourth of a course of sanitary lectures at the Gloucester School of Science was delivered by Mr. F. W. Waller, on "Comfort and Health in existing Homes." The lecturer referred to the necessity for greater legislative powers being passed to prevent overcrowding, to abate nuisances, and to compel builders to adopt proper sanitary precautions. Town houses might be periodically inspected, and the landlord granted a certificate of healthiness where it ought to be given, and no houses let without a proper certificate. Though this would cost money, a vast amount would be saved in preventible illness.

A Railway King.—Asa Foster, who died at Montreal on November 1, is stated to have been one of the most enterprising men in the Dominion. He was contractor for part of the Grand Trunk Railway and for various other railways in Canada. On the accomplishment of the confederation he was appointed to the Senate of the Dominion, but retired from it two years ago on receiving a contract for the construction of the Georgian Bay Branch of the Pacific Railway. At the time of his death he was actively engaged in making arrangements to complete this contract.

Depression of Trade in South Wales.—The *Times* cites, as a proof the depressed state of the coal and iron trade in South Wales, the fact that there now stand in the parish of Merthyr alone the extraordinary number of 1,000 houses unoccupied and untenanted. An extensive exodus of the working class has been going on for some time, and colliers who have for years lived in the district have now left it for the county of Monmouth, or the more flourishing fields of the Rhondda Valley.

The Middle Level Outfall Sluice.—The new sluice at the Middle Level Works, near Lynn, has been opened. The engineer is Sir John Hawkshaw, and the contractor Mr. Webster. The cost is between 40,000*l.* and 50,000*l.*, and by it 200,000 acres are to be drained, and rivers to the extent of 200 miles. The sluice is in substitution of syphons, which will now be discontinued. It is said that the fen country of the Isle of Ely will now be safe from inundation.

The Masons' Strike.—Mr. Bull, the contractor for the New Law Courts, having been in Germany some time for the purpose of selecting for himself men capable of work, and willing to come to this country to serve him, has been so far successful that he returned to the works on Wednesday morning with 129 German masons. In each instance the men have signed a contract for twelve months, their pay averaging from 7d. to 9d. the hour. Fifteen German masons, who came to this country of their own accord,—paying their own passage,—commenced work on Tuesday at the Law Courts, and they report that fifteen others will shortly follow their example. It is said that the American masons are so satisfied with their position that the wives and families of several of them are now on their way to England to join them.

The "Premium" Door and Gate Spring. At first sight the position of the spring (which is shown by an illustration in our advertising columns) would seem to render it liable to bulging, but experience of it contradicts this impression. It is one of the simplest and cheapest of springs that we know of for the intended purpose, and if it be found to endure (as we have little doubt will be the case) it can scarcely fail to come into use.

Site for Cleopatra's Needle.—We are glad to hear that Mr. John Dixon has sought and obtained permission to erect another dummy obelisk (in addition to that placed in Parliament-square) on the Victoria Embankment, either at the foot of Northumberland-avenue or inside the railings of the gardens opposite the York Steps, about midway between Waterloo and Charing-cross Bridges, as he may deem best.

The Model Bye-Laws.—The report on the "Model Bye-laws" by the Council of the Liverpool Architectural Society is worth the attention of those who are investigating their worth or otherwise. The reporters consider the proposed laws on the whole "grievous and oppressive." The report is printed by J. A. D. Watts & Co., Liverpool.

Serious Fire at a Builder's.—On Monday morning, between nine and ten, a fire of a very extensive character happened in the larger pile of buildings belonging to Messrs. F. J. Terry & Co., builders, &c., of Effra-parade, High-road, Bromley, Kent. It is understood that Messrs. Terry's business will not in any way be delayed through the fire.

Glasgow University.—The Marquis of Bute has offered to build, at his own expense, and to present to the University of Glasgow, the grand hall of the new buildings, according to designs proposed by Sir Gilbert Scott, R.A. It is estimated that the building will cost from 70,000*l.* to 80,000*l.*

Competition Plans for Hospital for Infectious Diseases.—The Maidenhead Town Council have awarded the first premium to the author of the plans under the motto "Ad Rem," and the second premium to the author of the plans under the motto "Serio."

Northfleet Brick Company.—Some of our readers may be interested in knowing of the formation of a company under this title for the purpose of acquiring and working a leasehold property at Northfleet, Kent, for the manufacture of bricks.

Sinking of the Roadway, Shoe-lane.—On Monday morning some alarm was occasioned in Shoe-lane by reason of the sinking of a portion of the roadway and footways at the northern end of the thoroughfare lying between the bridge close to Dr. Parker's chapel and Charterhouse-street. This subsidence appears to have been caused by excavations in the vacant land on both sides of the street, carried on at a great depth below the foundation of the buildings which had previously stood there.

Dray's Patent Concealed Urinal.—This heading itself explains the merit claimed for Dray's arrangement. It is a great improvement upon the intrusive affair often seen, and in a case under our own eye has acted for some time perfectly well.

TENDERS.

For proposed alterations at the Prince of Wales Tavern, 119, Hampstead-road, for Mr. G. K. Turnham. Mr. J. R. Furniss, architect:—

Batchelder	£753 0 0
Sommerville & Smith	700 0 0
Evers	695 0 0
Schlater	659 0 0
Gould & Brand	629 0 0
Ashby & Nicholls	620 0 0

For alterations and additions to the Stafford Hotel, Paddington. Messrs. Bird & Walters, architects. Quantities supplied:—

Newman & Mann	£3,220 0 0
Temple & Foster	3,185 0 0
Lawrance	3,150 0 0
Brass	3,149 0 0
Williams & Son	3,078 0 0
Mark	2,980 0 0
M'Lachlan & Sons	2,869 0 0
Hockly	2,830 0 0
Marr	2,816 0 0
Nightingale	2,744 0 0
Langridge & Sons	2,694 0 0
Anley (accepted)	2,670 0 0

For Llanbister schools. Messrs. Haddon Brothers, architects. Quantities supplied:—
Speake (accepted).

For rebuilding Black Lion public house, Whitefriars. for Mr. Causton. Messrs. Groome & Dixon, architects, Mr. C. Kirkly, surveyor:—

Stamp & Bowtle	£2,445 0 0
Steel Bros.	2,410 0 0
Lawrence	2,403 0 0
Langmead & Way	2,390 0 0
Andrews	2,340 0 0
Patman & Fotheringham	2,285 0 0

For Chiswick main drainage. Contract No. 2. Engines, pumps, and machinery. Mr. H.O. Smith, engineer:—

Thwaites & Carbutt	£3,775 0 0!
Jackson	3,378 0 0
Amos & Smith	3,370 0 0
Dale	3,032 18 0
Hayward, Tyler, & Co.	2,996 14 6
Young & Co.	2,950 0 0
Vulcan Foundry Company	2,749 17 0
Moreland & Son	2,672 0 0
Holroyd, Horsford, & Wilson	2,642 15 0
I'Anson & Co.	2,638 0 0
Oliver & Co.	2,553 8 0
Mason & Co.	2,545 14 0
Stott & Co.	2,400 0 0
Gwynne	2,364 16 0
Simpson & Co.	2,349 10 8
Hett	2,345 0 0
Pontifex & Wood	2,224 14 8
Swift & Dod	2,148 5 0
North Moor Company	2,105 0 0
Hathorn, Davis, Campbell, & Co.	1,990 0 0!

For converting and finishing two carcasses into showrooms and warehouses, at Folkestone, for Mr. John Banks. Mr. Burgess J. Reeve, architect:—

Payne	£1,180 0 0
Prebble	1,140 0 0
Brooks	1,098 0 0
Slade	1,050 0 0
Butler	989 0 0
Holdom (accepted)	960 10 0

For pulling down and erecting a new front to the Victoria Inn, Folkestone, for Messrs. A. Langton & Co. Mr. Burgess J. Reeve, architect:—
Petts (accepted).

For Hereford Middle-class College. Quantities supplied. Mr. F. R. Kempson, architect:—

Baker & Sons	£16,800 0 0
Wood & Sons	15,655 0 0
Yates	15,597 0 0
Wingate & Son	14,970 0 0
Colman Brothers	14,846 0 0
Welsh	14,300 0 0
Stephens & Bastow	14,299 0 0
Bowers	13,479 0 0

For warehouse at Sharpness. Quantities supplied:—

Chubb	£3,601 0 0
Thompson & Roberts	3,530 0 0
Church	3,211 0 0
Stephens & Bastow	3,208 0 0
Brock & Bruce	3,150 0 0
King	3,068 0 0
Jones & Co.	3,061 0 0
Robertson	2,993 15 0

For staircases in Hopton Wood and Parkspring stone to shops in Moorgate-street, for Mr. Cave. Mr. Pearson, architect:—

Beevers	£1,295 0 0
Tilney & Co.	1,000 0 0
Maslin Bros.	754 15 0

For erecting three premises, Salisbury-court, Fleet-street. Mr. A. Peebles, architect:—
Langmead & Way (accepted).

For block of four cottages, Maidenhead, for Mr. J. J. Britton. Mr. E. J. Shrewsbury, architect:—
Woodbridge (accepted) £735 0 0

For granaries, &c., for Messrs. Gibson & Co. Mr. E. J. Shrewsbury, architect:—
Woodbridge (accepted) £400 0 0

For proposed house and stables, at Crouch-end, for Mr. H. Ryder. Mr. W. Trehearne, architect. Mr. R. S. Wardle, surveyor:—

Patman & Fotheringham	£1,875 0 0
Anley	1,860 0 0
Faulkner	1,835 0 0
Nightingale	1,816 0 0
Langmead & Way	1,745 0 0

For the erection of a detached house in Holly Park, for Mr. J. Wilson. Messrs. W. Waymouth & Son, architects:—

Sheffield & Prebble	£810 0 0
Smith & Co.	804 0 0

For detached house at Mount-pleasant. Messrs. W. Waymouth & Son, architects:—
Smith & Co. £815 0 0

For joinery for Mr. W. Perry. Mr. J. Ashby, architect:—

Torode	£520 17 6!
French	238 8 0
Lascelles	220 0 0
Rees & Son	200 0 0
Godbolt	196 3 0
Sawbridge	195 13 4
White	170 0 0
Row	170 0 0
Webber	170 0 0
Brock & Bruce	165 0 0
Dowland	150 11 6
Bowers	150 0 0
Longman	148 11 8
Smitheman	147 0 0
Fowler	127 0 0
Thomas (accepted)	110 11 10!

[How is this to be explained?—Ed.]

TO CORRESPONDENTS.

P. C. C.—E. L. G.—S.—S. P.—S. H. B.—J. & Son.—J. F. & Sons.—W. H.—M. & Co.—F. C. P.—H. W.—Victoria.—J. B.—L. A. F.—T. D. B.—G. R.—J. B. B.—J. L.—H. C.—J. A.—L. & W.—J. H. T.—H. O. S.—M. (ne).—F. T. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

CHAPPUIS' PATENTS

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.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION.